ELECTRICAL EXHIBITION

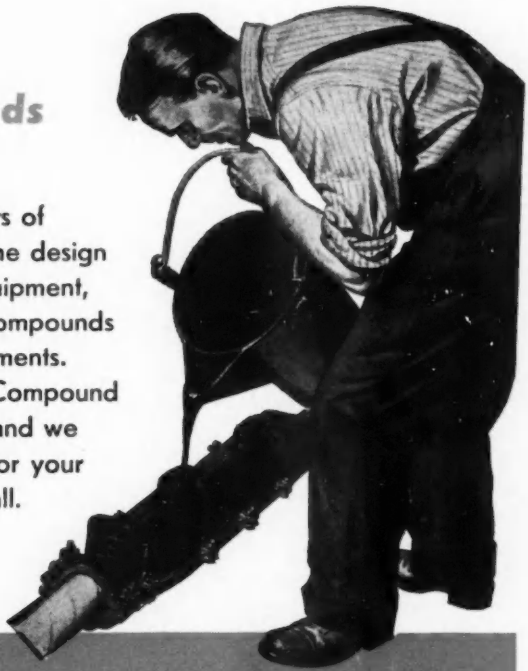
# ELECTRICAL TIMES

THURSDAY
19 MAR.
1953
NINEPENCE

## Use the right compounds

HENLEY'S, during fifty years of specialized experience in the design of electrical distribution equipment, have evolved a range of compounds to meet all jointing requirements. There's always a HENLEY Compound that's just right for the job and we shall be pleased to quote for your requirements—large or small.

**Catalogue 57 gives full details.**



Use HENLEY

2nd SUPERVISING ENGINEERS EXHIBITION
*Earls Court Mar. 25-28*
VISIT STAND No. 62

INSULATING COMPOUNDS

*for Electrical Distribution Equipment*

W. T. HENLEY'S TELEGRAPH WORKS CO. LTD., 51-53 HATTON GARDEN, LONDON, E.C.1

## Keeping Electricity in its proper place

MICA WASHERS are the economic and efficient answer to many problems in all forms of electrical apparatus. Produced in an almost endless variety of shapes and sizes, these washers can be manufactured in practically unlimited quantities by M & I with their unique facilities at Empire Works. Up to about 0.040" the block mica can be used in its natural thicknesses, but above this thickness it is customary to build up the block with a suitable cement.

The manufacture of washers from block mica is normally confined to diameters not exceeding about 2.5". Above this size it is more economical to machine washers from micanite sheet, the grade normally employed being Hard Micanite Board.

m and i

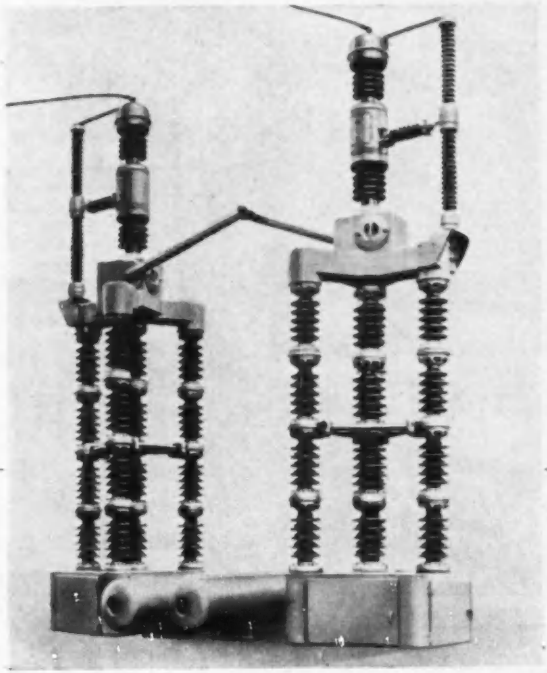
**THE MICANITE & INSULATORS CO. LTD.**

**Empire Works, Blackhorse Lane, Walthamstow, London, E.17**

BRANCH OFFICES AT BIRMINGHAM, CARDIFF, GLASGOW, MANCHESTER AND NEWCASTLE-UPON-TYNE AND REPRESENTATIVES IN MOST COUNTRIES THROUGHOUT THE WORLD.

Manufacturers of MICANITE (Built-up Mica Insulation). Fabricated and Processed MICA. PAXOLIN Laminated Materials. PANILAX Laminated Materials and Mouldings. EMPIRE Varnished Insulating Cloths and Tapes. HIGH VOLTAGE BUSHINGS and TERMINALS. Distributors of Micoflex-Duratube Sleevings, Micoflex-Durasleeve (Plastics-covered flexible metal conduit) and Kenutuf Injection Mouldings (in most thermoplastics including P.V.C.).

***One of the range***



This 220kV 5000 MVA four-interrupter circuit breaker is one of the range of 'ENGLISH ELECTRIC' high voltage air-blast circuit breakers using common interrupters and other standard parts.

# 'ENGLISH ELECTRIC'

## air-blast switchgear

THE ENGLISH ELECTRIC COMPANY LIMITED, Queens House, Kingsway, London, W.C.2.

*Switchgear Department, Stafford.*

WORKS: STAFFORD · PRESTON · RUGBY · BRADFORD · LIVERPOOL · ACCRINGTON

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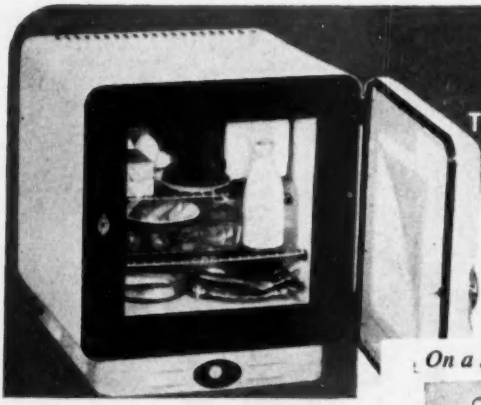


"Astral"

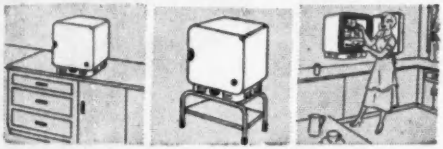
THE SMALL REFRIGERATOR WITH THE BIG MARKET

The Astral brings refrigeration within the means of new millions. It is reasonably priced, small enough for the tiniest kitchen, yet big enough to store all the perishable food for the average sized family.

This Scottish made refrigerator has swept America and Canada. National advertising commencing shortly will create demand in this country.

Silent, motorless, no interference with Radio or T.V. Guaranteed for two years. Measures 21¼ in. high by 21¼ in. wide by 23½ in. deep.

*On a shelf . . . on a stand . . . 'hung' on a wall*



Astral REFRIGERATORS

*. . . designed for the smaller kitchen*

ASTRAL EQUIPMENT LTD., 96 BUCHANAN ST., GLASGOW, C.1.

COLD CATHODE

FLUORESCENT

LIGHTING

and

Neon SIGNS

COMPLETE INSTALLATIONS erected and maintained for the Trade using plain vans.

*Quotations and layouts free on request*

CHASE PRODUCTS (Engineering) LTD

27 PACKINGTON RD., SOUTH ACTON, W.3

*Acorn 1153-4* *and at Leeds*

SHUNT FIELD

RHEOSTATS

For Motors, Generators and Alternators. Also as series Rheostats for voltage, heat and speed control. We shall be pleased to send full particulars and prices on request. And remember, the advice of Cressall Technicians is always available.

CRESSALL

*Registered Trade Name of*

THE CRESSALL MANUFACTURING CO. LTD

Tower Street, Birmingham 19

*Telephone*: ASTon Cross 2666 (3 lines)

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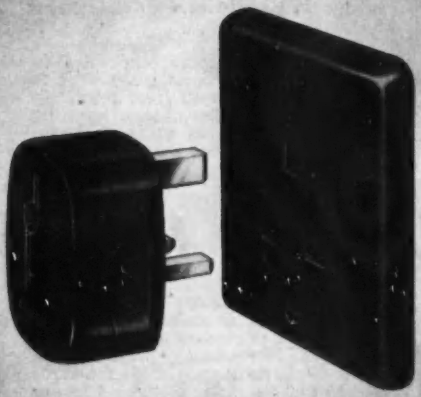
*Electrical* **ACCESSORIES**



13 AMP. SOCKET OUTLET FUSED PLUG TO B.S.1363

DETAILS ON REQUEST

BILL SWITCHGEAR LTD
ASTON LANE · PERRY BARR
BIRMINGHAM 20

# WHATEVER THE NEED···

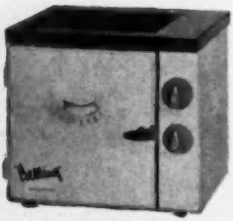
**···there is a Belling cooker to suit every home and every pocket whether it's···**

## LARGE

The BELLING STREAMLINE has 2 boiling-plates and a grill-boiler. The oven is extra large with an inner glass door and interior lighting. Automatic heat control throughout. White or cream vitreous enamel. Price **£49.10.0.** Available on wheels 55/- extra.

The BELLING 47 is easy and economical to use. The full size inner glass door is armourplate and steam free. 2 boiling-plates and grill-boiler. Large warming cupboard. In gleaming white or cream vitreous enamel. Price **£34.12.6**

## SMALL···OR IN-BETWEEN



The WEE BABY BELLING is ideal for the small home or as an auxiliary where other means of cooking are used. But it will cook a full meal easily, quickly and economically. There's room for three saucepans on top. Cream vitreous enamel. Price only **£6.19.6.**

The BABY BELLING is perhaps the best known of the whole range. A good large oven—almost as large as a full-sized cooker! Large warming compartment. In white or cream vitreous enamel. Price **£13.15.0.**

Have you a stock of these Belling Cookers to meet the demand? They are being extensively advertised and a great many people are asking about them. If your stocks are getting low, please put your order in to us as soon as possible.

WE ARE EXHIBITING Daily Mail IDEAL HOME EXHIBITION OLYMPIA MARCH 3-28

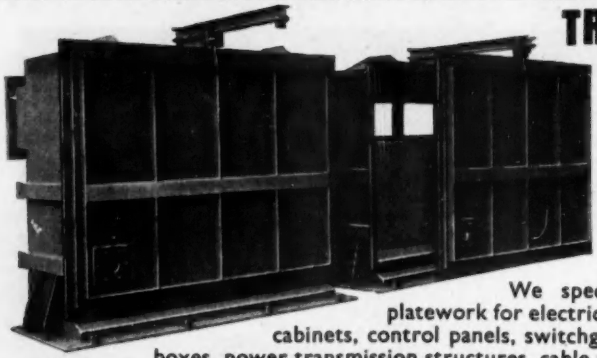
**you can't beat a "Belling"**

BELLING & CO. LTD. BRIDGE WORKS · ENFIELD · MIDDLESEX · HOWARD 1212

CRC 398

**VENNER LIMITED,** Kingston By-Pass, New Malden, Surrey

*Telephone:* MALden 2442



Weight 3½ Tons each

# TRANSFORMER TANKS

MEDIUM-HEAVY PLATEWORK TO ENGINEERS' SPECIFICATIONS

We specialize in fabricated platework for electrical engineers, cubicles, cabinets, control panels, switchgear framework, cable boxes, power transmission structures, cable and busbar ducts, etc. Mass production of small parts and sub. assemblies to drawings. Our ventilating department handles fans, heaters, dust plant and full comprehensive schemes.

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RELIANCE WORKS, BAGULEY,
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# COVERED
## winding wire and strip

Specify **"KEW COVERED"** for dependability through the years

**KENT BROS. ELECTRIC WIRE CO. & E. H. PHILLIPS LTD.**

KEW WORKS KEW · RICHMOND · SURREY
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# IMAGINE for one MOMENT

A COOKER that has 2 boiling plates, self-contained grill chamber, totally enclosed oven, large storage compartment; needs no control unit; cooks for six —and to spare; plugs into a 13 amp. power point; and costs only £22.16.6. Not possible, you say? It IS possible. It's the

**Tricity 528**

HERE ***NOW***—FOR THE FIRST TIME—
*with all the best features of electric cooking at an incredibly low price. Send for details: show a sample.*

**And to fill in the rest of the blanks:**

Grill Boiler } E.D.A.
G.E.C. plate } Standard.

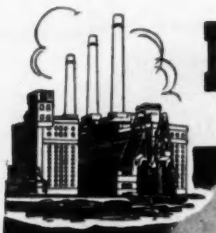
Fully lagged independent oven with automatic control. Vitreous enamel finish *inside* as well as out.

Optional extras:
Simmerstat 15/6
Radiant plate 27/6

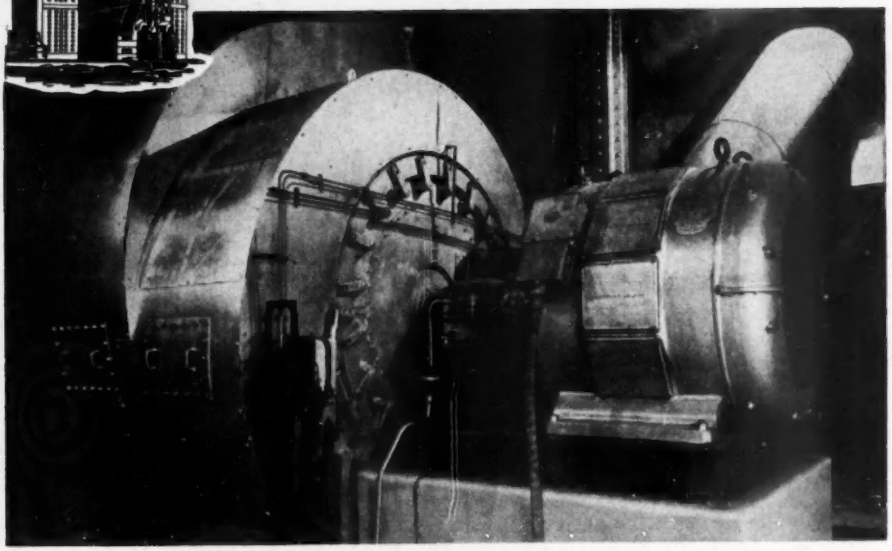
**TRICITY COOKERS LTD**

**109, Kingsway, London, W.C.2. Telephone: HOLborn 2161**

A PRODUCT OF Thorn ELECTRICAL INDUSTRIES LTD.



# L.D.C. 'Corcooled' Motors



*Induced draught fans at the Kingston Power Station driven by a 2-speed squirrel cage L.D.C. "Corcooled" motor. 295/164 H.P., 735/585 r.p.m.*

The design and construction of 'Lancashire Dynamo' "Corcooled" totally enclosed motors ensures that the fume- or dust-laden atmosphere does not come into contact with the windings. The cooling method is efficient and an extensive range of these machines has been "Buxton Certified" as Flameproof in respect of Groups I, II and III gases.

A.S.E.E. EXHIBITION
EARLS COURT, 25-28 MARCH
STAND No. 6

LANCASHIRE CRYPTO

The Symbol of Power in Industry for over 50 years

**LANCASHIRE DYNAMO AND CRYPTO LTD.**

TRAFFORD PARK, MANCHESTER 17. ACTON LANE, WILLESDEN, LONDON, N.W.10

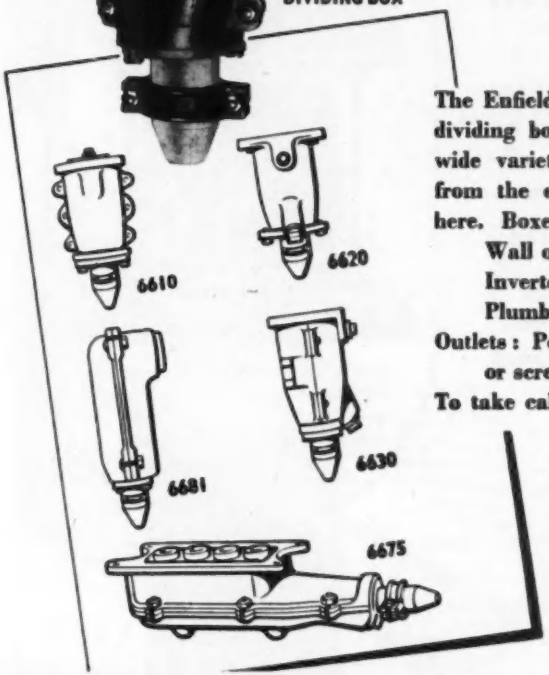
*Please note new London office address:*

ST. STEPHEN'S HOUSE, VICTORIA EMBANKMENT, WESTMINSTER, S.W.1

M/25

STANDARD
L.T. 3-CORE
DIVIDING BOX

# indoor dividing boxes




**The Enfield range of low voltage indoor dividing boxes has been designed for a wide variety of purposes. A selection from the extensive range is illustrated here. Boxes are supplied for:**

**Wall or switch mounting.**
**Inverted or horizontal positions.**
**Plumb or non-plumb glands.**

**Outlets: Porcelain, wood bushed, or screwed for conduit.**

**To take cables up to .5 sq. in. 4-core.**

*Send us your enquiries for all cable accessories.*

Stand 65
A.S.E.E. Exhibition

# ENFIELD indoor dividing boxes

*Light Engineering and Mains Cable Accessories Department*
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**TOTtenham 6611 (Works)** **London Office: HOLborn 9292**

Enfield

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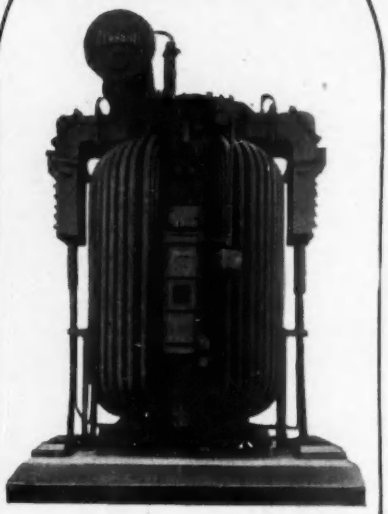
## MOVING COIL VOLTAGE REGULATORS

## For Transmission and Distribution

The Ferranti Moving Coil Voltage Regulator provides a simple, efficient and reliable method of smoothly regulating or stabilising alternating current systems under load conditions. Any desired range of voltage variation under automatic or remote control can be provided.



*2,900 kVA Automatic Moving Coil Regulator. 6700—6060/6700 volts.*

*Fully automatic Regulator, Feeder Pillar Type*

*For alternating current transmission or distribution circuits. Feeder pillar, street pit, house service, etc., construction.*

FERRANTI LTD · HOLLINWOOD · LANCS

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**COPPER WIRE**
plain or tinned, cotton, paper or asbestos covered.

**ALUMINIUM WIRE and STRIP**
plain, cotton, paper or asbestos covered.

**COPPER or ALUMINIUM STRAND**
for overhead power transmission.

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**CADMIUM COPPER**

*Also* K *for* LIGHT ALLOY

**CONDUIT TUBING, BARS, TUBES AND SECTIONS**

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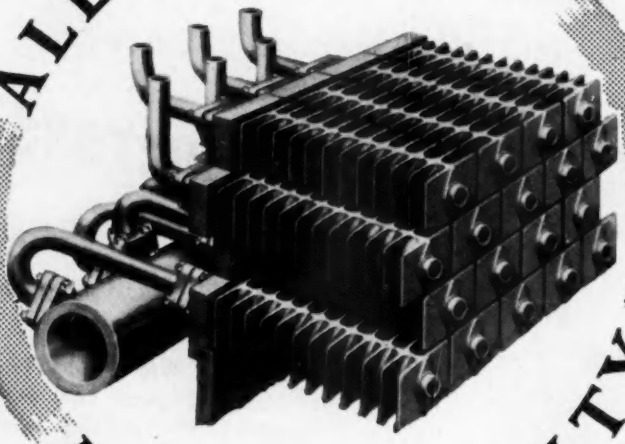

*Type* 12. *Steel tubes with cast-iron gills: suitable for the highest pressures.*

**Green's Premier Diamond Economisers, Types 25 and 12, feature the famous gilled cast-iron tube or sleeve construction which permits better access for cleaning and all-round inspection of every part.**

GREEN'S ECONOMISER

E. GREEN & SON LTD · WAKEFIELD

*Makers of economisers for more than one hundred years*

GE 104

It's all a matter of research and good design translated into practice. The anisotropic alloy used in the magnets of our commercial grade meters has high coercivity and an almost flat recoil line, permitting large magnet gap and maximum freedom from external interference. That's good technique. However, you're concerned with results. Repeat orders from all over the world for our electricity meters prove that in practice they're all you want them to be and that

meters are matters for

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**Remote Control Division, 7/17 Fitzalan Street, Kennington, S.E.11.**

*A Company of the Parkinson & Cowan Group*

RBP

*First again!*

The SCEMCO '57'
2ft 40W TWIN FLUORESCENT
FLOODLIGHT

**TURNS NIGHT INTO DAY!**
One fitting floods a six storey building for fractional cost of Sodium or Tungsten

**WEATHERPROOF CONSTRUCTION**
For outdoor use for lighting: — Garages, Hotels, Road Houses, Signs, etc.

LIST PRICE £10·17·6 COMPLETE (*LESS LAMPS & CABLE*)

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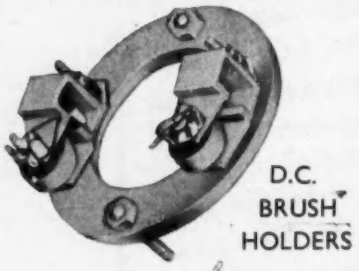
SCEMCO LTD OF SOHO STREET LONDON W1 · GER 1461



D.C. BRUSH HOLDERS

**SYNTHETIC CARBON & ENG. CO. LTD.**
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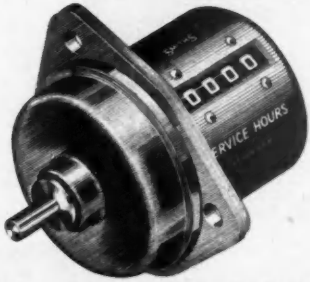
*Figures in Industry*




**ENGINE SERVICE COUNTERS**

. . . provide accurate information for servicing engines, compressors, etc., or for charging equipment on hire. After 10,000 hours the counter continues from zero. A heavy duty type counter is available for extreme climatic or particularly arduous conditions.

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**SMITHS INDUSTRIAL INSTRUMENTS LTD**
CRICKLEWOOD WORKS, LONDON, N.W.2
*The Industrial Instrument Division of S. Smith & Sons (England) Ltd.*
188-195

No. 10

# *ESSEX BEAUTY SPOTS*

*The illustration and information are taken from "Journeying into Essex," by W. R. Finch —printed by S. E. Recorders Ltd., Ilford*

## EPPING

A FOREST in which Boadicea fought and Dick Turpin roved. Bought by the Corporation of the City of London for £250,000 and declared a permanent open space by Queen Victoria in 1882.

*ESSEX is also the home of:*

**THE METROPOLITAN ELECTRIC CABLE & CONSTRUCTION Co. Ltd.**

**CLYDE WORKS, CHADWELL HEATH, ESSEX**

**Tel.: SEVEN KINGS 1810** **Grams.: METROCABLE**

THESE photographs, illustrating past and present Revo installations, give a good indication of the possibilities of floodlighting appropriate to Coronation Celebrations. Revo floodlights, suitable for all applications, are available for use with Tungsten, Sodium, Mercury and Fluorescent lamps.

**See these fittings on our STAND No. 54, A.S.E.E. Exhibition, March 25th to 28th.**

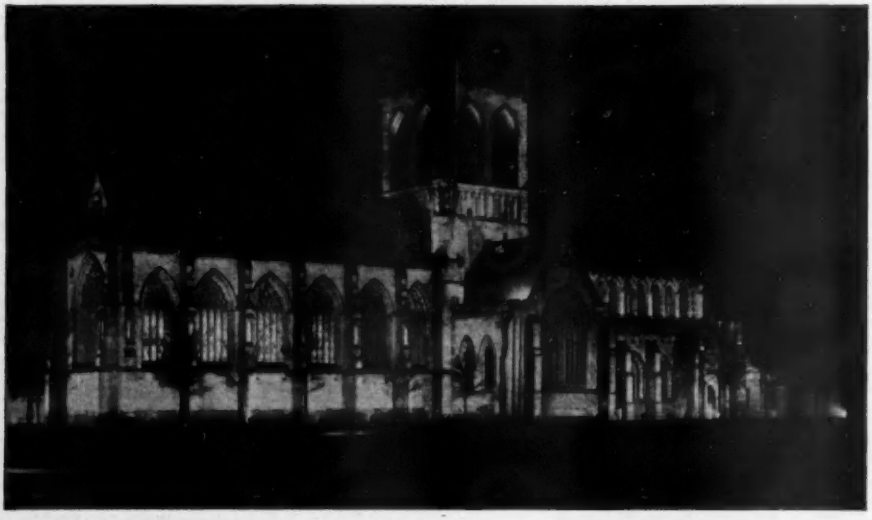
*(Top left)*
*War Memorial, Oxford, a good example of concentrated floodlighting.*

*(Below)*
*Paisley Abbey—typical of many Revo installations.*

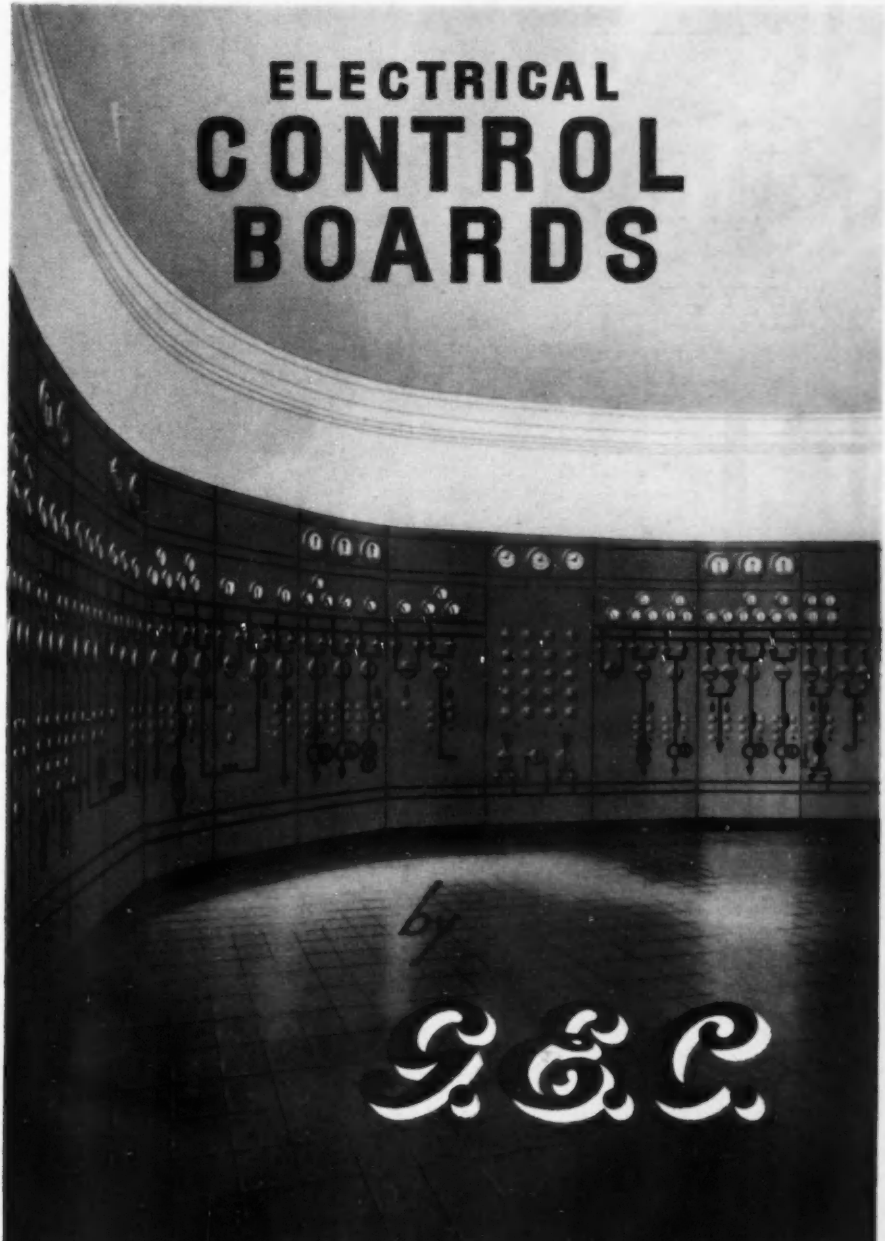
C.13106

REVO REGD.

# Floodlights for the Coronation



REVO ELECTRIC CO. LTD., TIPTON, STAFFS




THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

# It's MEM now for Plugs and Sockets

Here are MEM's versions of 13 amp. 3-pin fused plugs and shuttered socket outlets to comply with BS.1363. The new designs for domestic and similar purposes are particularly suitable for ring main circuits, and include all these desirable features:

- *Access to live terminals is impossible until the shutter has been unlocked by insertion of the earth pin.*
- *Porcelain base of socket is definitely non-tracking.*
- *One piece plug pins and terminals are removable and all cable leads can be cut to same length, thus facilitating wiring.*
- *Plugs will accommodate BS.1362 cartridge fuse-links rated at 13, 7 or 3 amps. Space provided for spare fuse in plug cover.*
- *Available in brown or ivory white.*
- *Pressed steel boxes with knockouts are available to British Standard Specification. Wood boxes also supplied.*

Send for List No. 320 describing the MEM range of plugs and sockets, wood and iron boxes. Prices are highly competitive.

**MIDLAND ELECTRIC MANUFACTURING CO. LTD., TYSELEY, BIRMINGHAM 11**

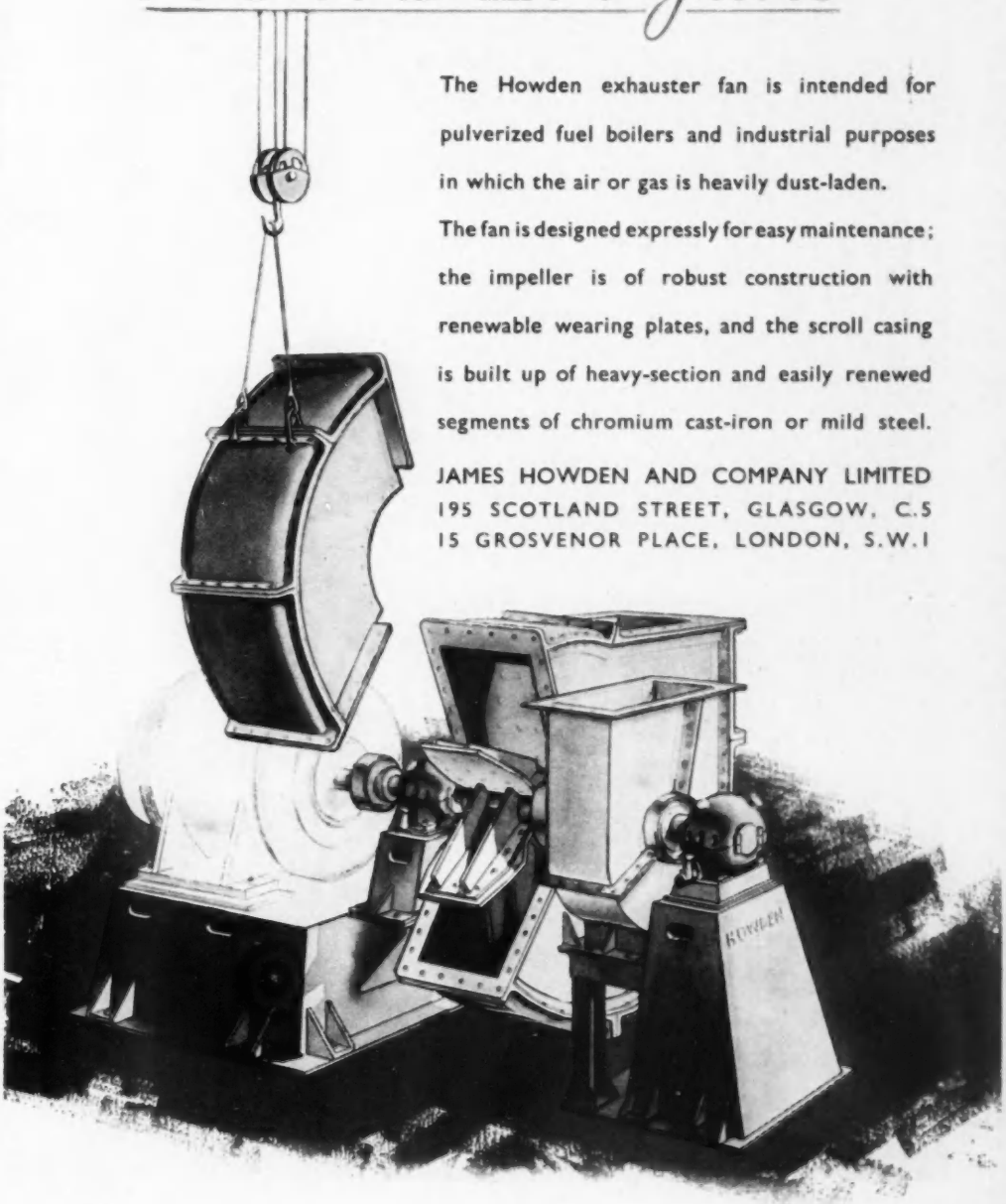
Branches in London and Manchester

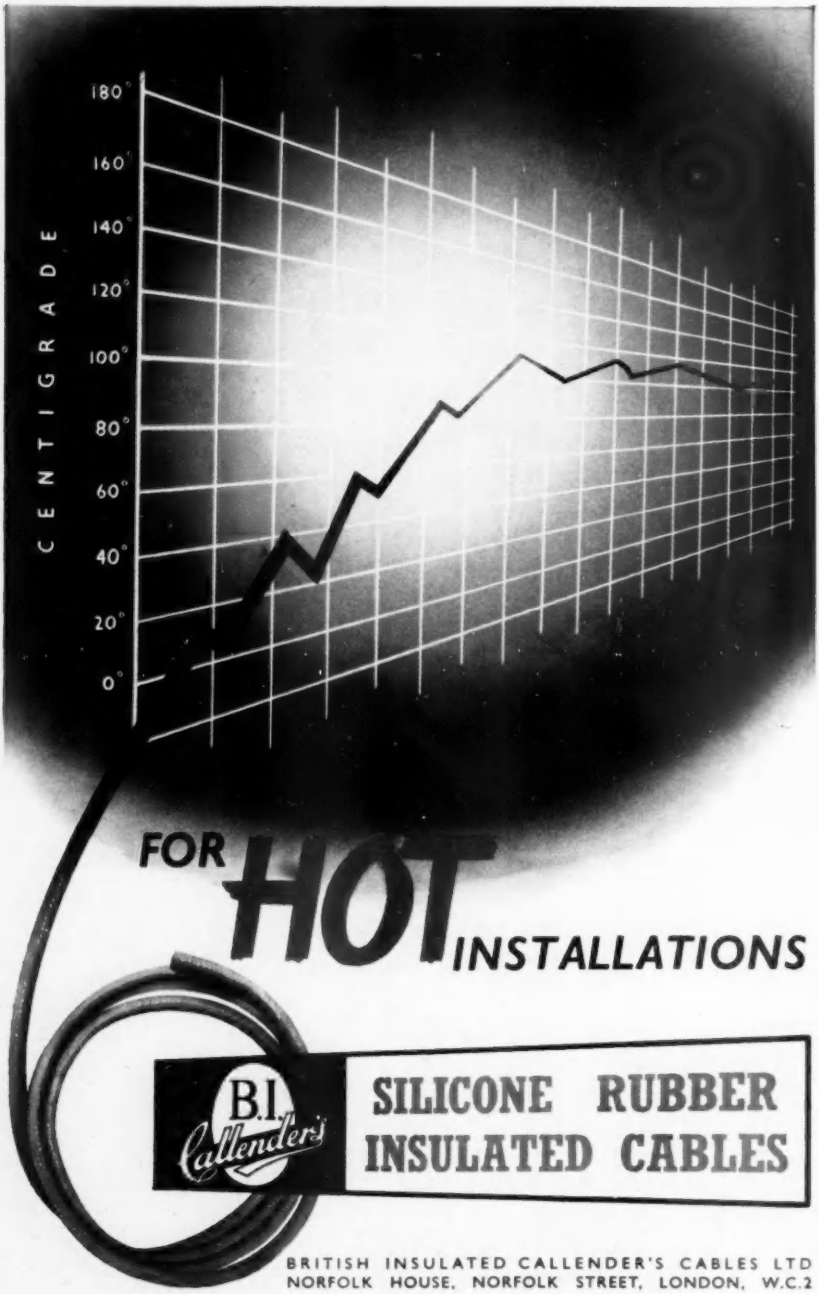
# HOWDEN *fans*

The Howden exhauster fan is intended for pulverized fuel boilers and industrial purposes in which the air or gas is heavily dust-laden.

The fan is designed expressly for easy maintenance; the impeller is of robust construction with renewable wearing plates, and the scroll casing is built up of heavy-section and easily renewed segments of chromium cast-iron or mild steel.

JAMES HOWDEN AND COMPANY LIMITED
195 SCOTLAND STREET, GLASGOW, C.5
15 GROSVENOR PLACE, LONDON, S.W.1






FOR HOT INSTALLATIONS

B.I. Callender's

SILICONE RUBBER INSULATED CABLES

BRITISH INSULATED CALLENDER'S CABLES LTD
NORFOLK HOUSE, NORFOLK STREET, LONDON, W.C.2

CONTACTOR SWITCHGEAR LTD
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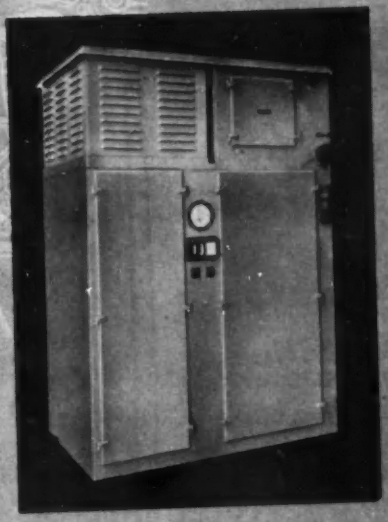
**Automatic Motor Control Gear**

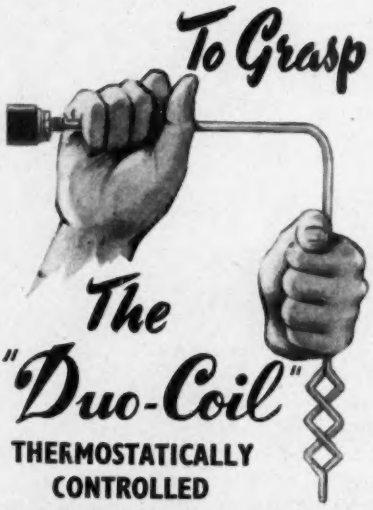


**For High Tension Machines**

One of a number of 300 H.P., 3,800 volts, 3 phase Stator and Rotor Starters controlling Slipring Motors driving rubber mills and embodying an emergency plug stopping feature.

CONTACTOR SWITCHGEAR LTD
BLAKENHALL WOLVERHAMPTON ENGLAND
Telephone Wolverhampton 25111 (5 lines)

AN OPPORTUNITY

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**IMMERSION HEATER**

- RIGID AND SIMPLE CONSTRUCTION FOR LONG LIFE AND ECONOMY
- ROBUST TEMPERATURE CONTROL non-radio interference
- ONE LOADING FOR ALL SIZES range 200/250 volts
- FIXED RATING 2.5 KW AT 240 V a.c. only
- LENGTH OF HEATER VARIED BY BENDING JIG
- JUST LOOK AT THE PRICE from £3 15s. 3d. plus P.T.
- AND THIS *INCLUDES* THE THERMOSTAT

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ELECTRO STEAM COOKERS Ltd.
COTSWOLD WORKS, CHALFORD
NEAR STROUD : GLOS.
Telephone—Brimscombe 2276/7

*— and then for fuses we'll have*

**SLYDLOK**

When engineers consider ease of location and wiring in their designs, they cannot choose a better fuse than Slydlok. Increased production capacity is improving delivery—please write for full details.

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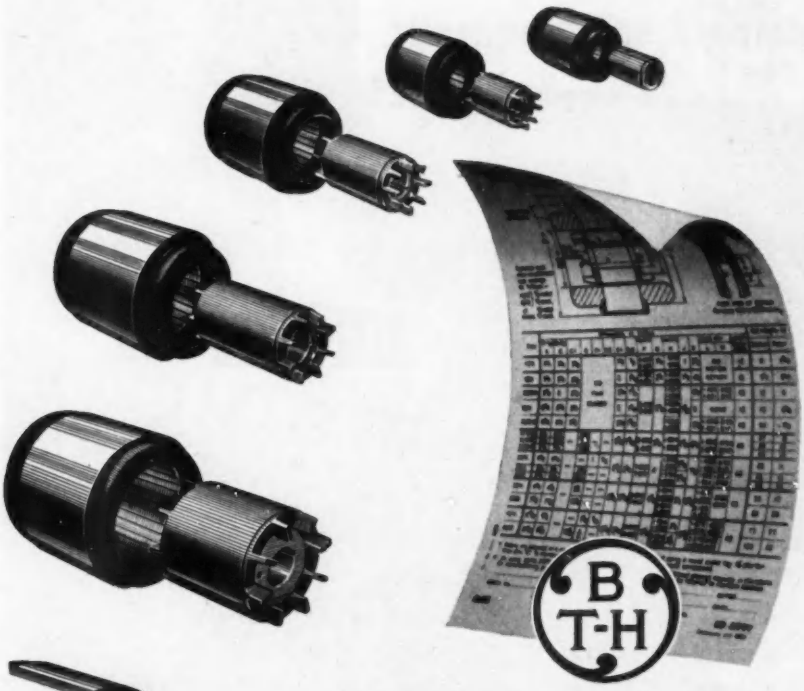
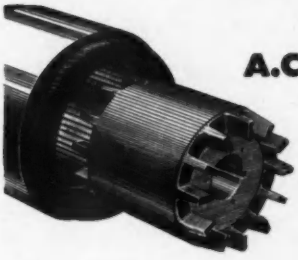
dm EW 43

# BUILD-IN A RELIABLE DRIVE!




## A.C. MOTOR UNITS UP TO 30 h.p.



Built-in electrical drives have many advantages— exceedingly compact, no unnecessary belts or shaft couplings — torque available precisely where required. The reliability of BTH A.C. motor units is unquestioned — many thousands are in everyday use, all over the World, driving machine-tools and other mechanisms.

*Advice will gladly be given by BTH specialist engineers.*
*Many sizes available from stock.*

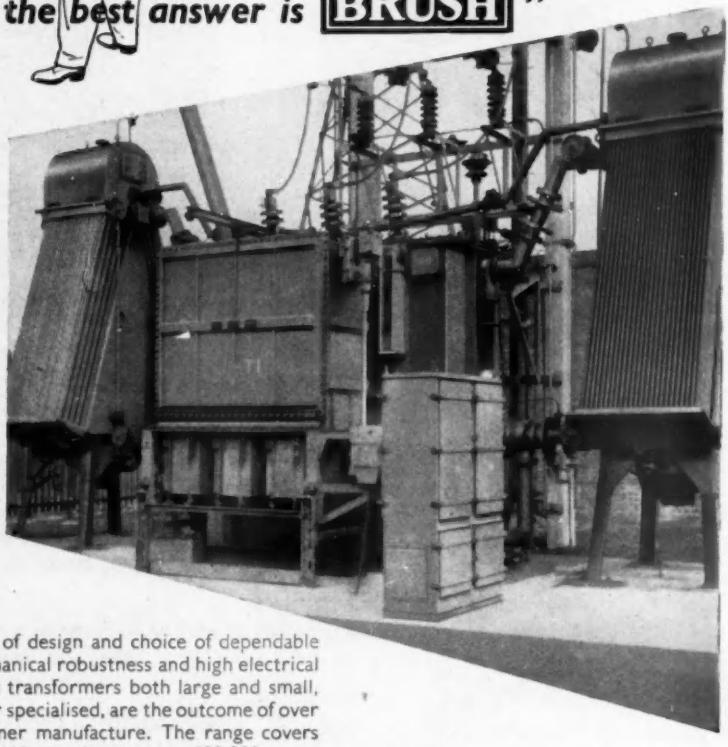
THE
**BRITISH THOMSON-HOUSTON**
COMPANY LIMITED, RUGBY, ENGLAND

Member of the AEI group of companies

A 4539

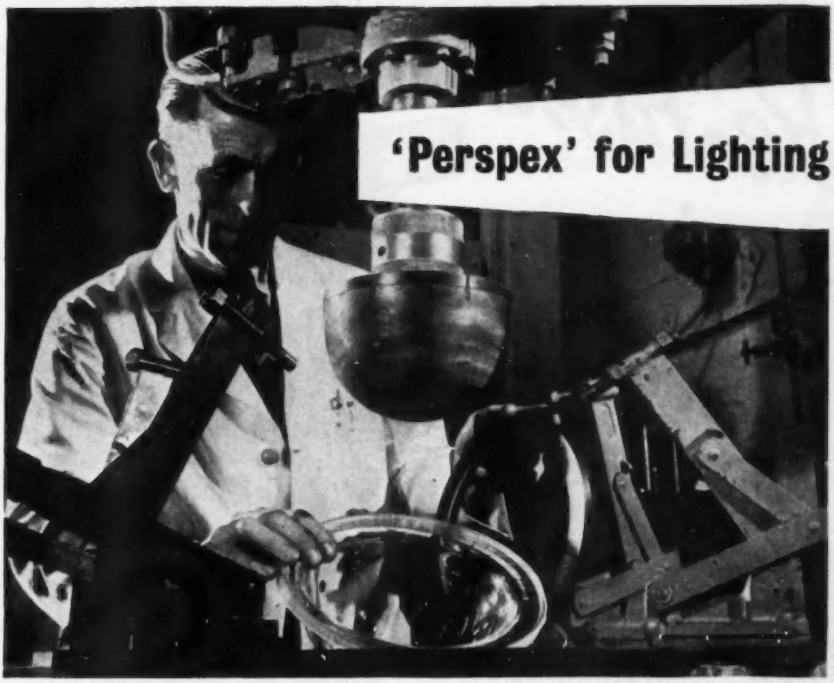
*" By the time you're ready to step into my shoes, you'll need no convincing that, where* ***transformers*** *are concerned . . .*

***the best answer is*** **BRUSH** ***"***



The development of design and choice of dependable materials for mechanical robustness and high electrical efficiency in Brush transformers both large and small, straightforward or specialised, are the outcome of over 70 years transformer manufacture. The range covers from 5 to 45,000 kVA at voltages up to 132,000.

**The Brush Electrical Engineering Co. Ltd. Loughborough, England (A member of the BRUSH ABOE Group)**
***London, Birmingham, Cardiff, Manchester, Leeds, Newcastle, Glasgow, Bath, Sheffield, Dublin.*** 15.89



# 'Perspex' for Lighting

*Shaping a 'Perspex' dome by a pressing technique*

An important characteristic of 'Perspex' acrylic sheet is the ease with which it can be shaped and fabricated. Experienced technologists in the Technical Service Laboratories of I.C.I. Plastics Division are serving the lighting industry by devising new shaping processes and fabricating prototype units to customer's requirements.

*'Perspex' is the registered trade mark of the acrylic sheet manufactured by I.C.I.*

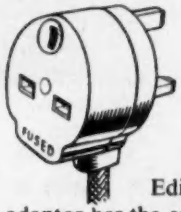
## I.C.I. Service to the Lighting Industry

ICI

IMPERIAL CHEMICAL INDUSTRIES LIMITED
LONDON, S.W.1

F.P.8

# Re-fused in 15 seconds




The new Ediswan plug adaptor has the same simple re-fusing device. This adaptor which is fused and shuttered, can be wired to an appliance in place of a normal plug. A second appliance can then be operated from the adaptor outlet.

Only fifteen seconds is needed to replace a fuse in an Ediswan rectangular pin plug. Merely insert a sixpence in the screw head, turn and the fuse is ejected. Turn back and the re-fusing is complete. No need at all to dismantle the plug.

A Catalogue and price list of the complete range of Ediswan Electrical Accessories is available on request.

| | | Cat. No. | List Price |
|---|---|---|---|
| Plugs | Brown | 4434 | 44/- Doz |
| | Ivory White | 4436 | 51/4 Doz |
| Adaptors | Brown | 6008 | 7/- Each |
| | Ivory White | 6009 | 8/- Each |

**EDISWAN**

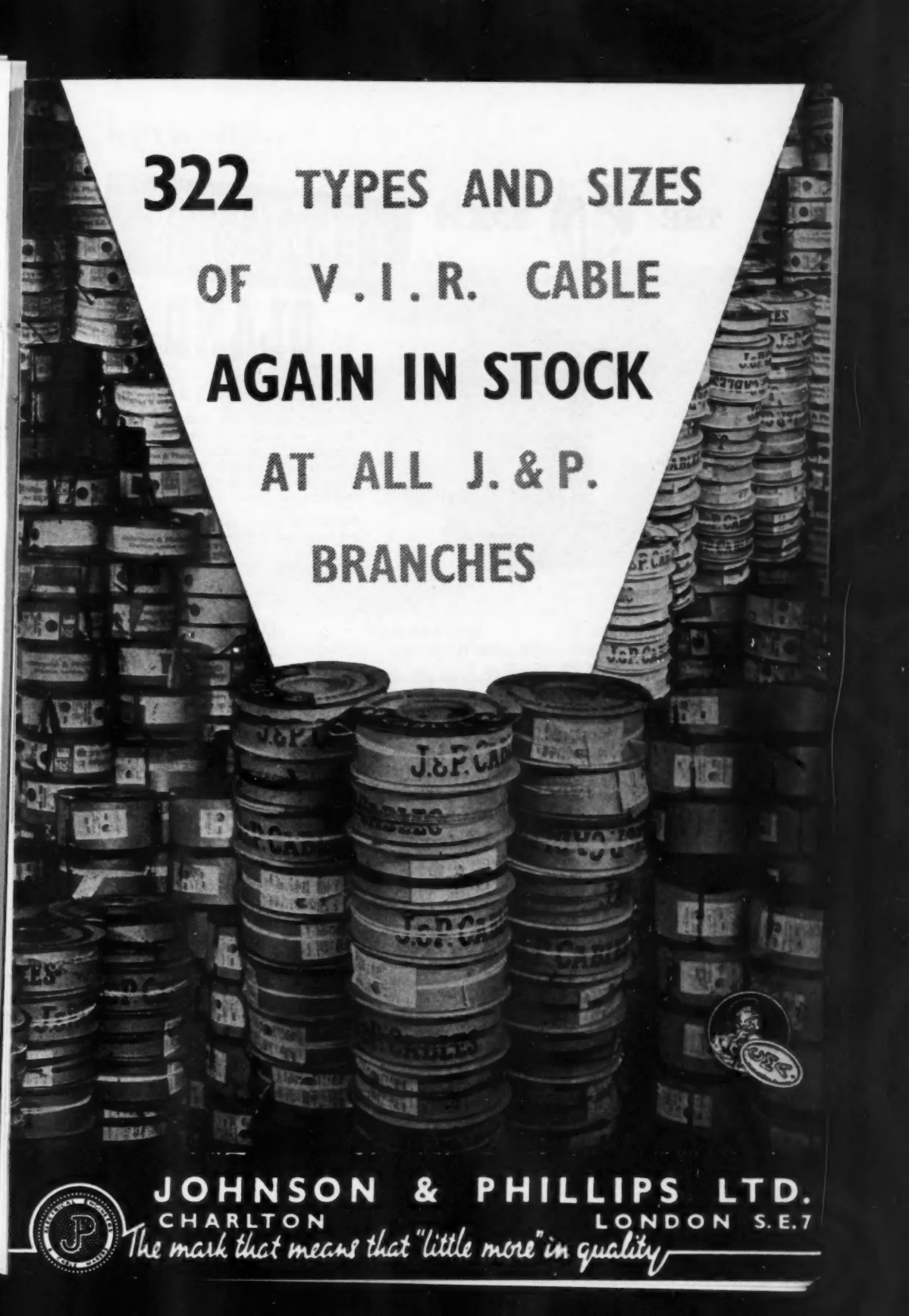
**CLIX**

THE EDISON SWAN ELECTRIC COMPANY LIMITED

155 Charing Cross Road, London, W.C.2, and Branches

*Member of the A.E.I. Group of Companies*

E17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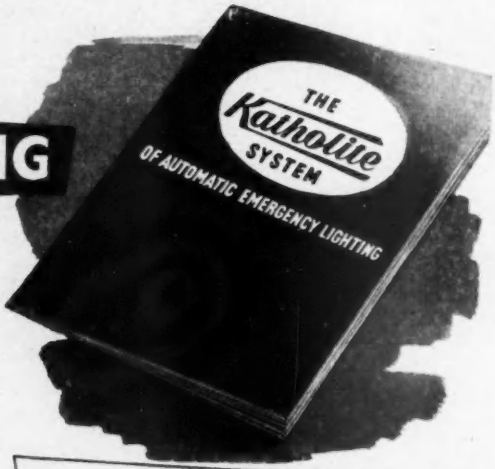
Of interest to LIGHTING Engineers everywhere..




This new publication deals with the installing and operating of the Katholite System of Automatic Emergency Lighting and contains much useful information, with circuit diagrams. A copy will be gladly sent you on request—please ask for publication No. D.P. 814.

**THE D.P. BATTERY CO LTD**

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J.247

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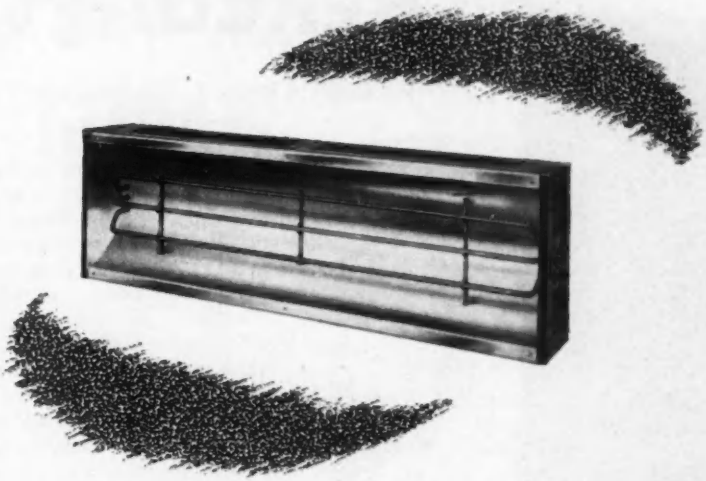


# . . . with Metrovick Elements

## INFRA-RED HEATING

The Metrovick element projector unit is proving a valuable aid to production in processes where the application of heat is concerned; in many cases processing times are reduced from hours to minutes. The units are made in standard sizes, 18 in., 24 in. and 36 in. long and special lengths can be supplied to suit manufacturers' individual requirements.

Our Heating Element Department will be glad to discuss your problems, and the demonstration rooms at Trafford Park and at 132-135 Long Acre, London are open for inspection and the actual testing of samples.

*Send for leaflet 703/7-1*

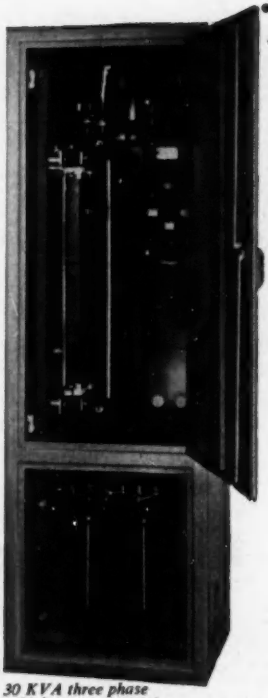
**METROPOLITAN-VICKERS ELECTRICAL CO. LTD., TRAFFORD PARK, MANCHESTER 17**
*Member of the A.E.I. group of companies*

METROVICK *"Redrings" for domestic use*

L/I 202

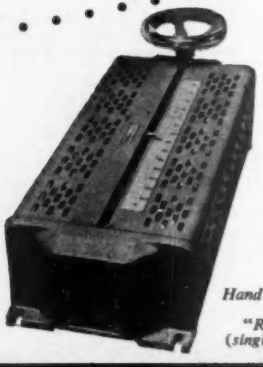
# BERCO/*B.P.T.*

## *Voltage Control Equipment*



*30 KVA three phase cubicle type automatic regulator.*

**BERCO/B.P.T.** voltage regulating and stabilising equipment is designed to afford a constant supply voltage to industrial scientific and electro-medical apparatus — and to all other electrical equipment which is normally sensitive to voltage fluctuation. Standardised sizes and ratings in single, three phase, hand operated and motor driven models meet most requirements but special designs can be made where necessary. Complete details and specifications obtainable without obligation. Please write for booklet 5091.



*Hand operated BERCO "Regavolt" (single phase).*

Applications include induction heating equipment, electric furnace control, radio and scientific equipment, X-ray apparatus, and meter testing equipment, etc.

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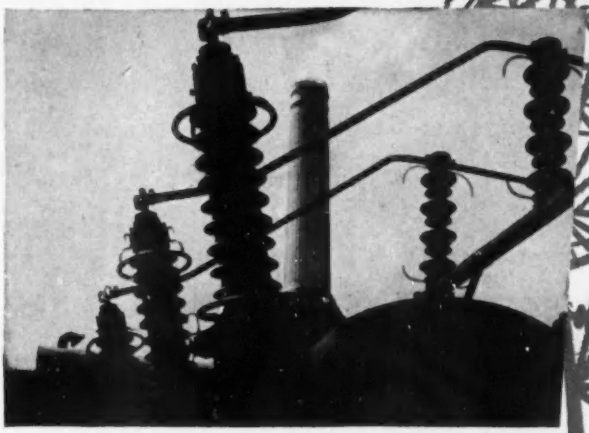

P & G Batteries play an important part in maintaining the efficiency of Britain's giant grid system. In countless substations where the flow of energy is broken down to comply with local needs, there you will find P & G Batteries operating vital switchgear or providing emergency lighting should the mains supply fail. The P & G service extends into many spheres, a natural result of 60 years' experience of battery manufacture and development. In round terms here it is. **1.** *Technical Advice and Specifications.* **2.** *Complete equipment and installation.* **3.** *Regular inspection and report.* A discussion of your scheme may help. We are always ready to agree that two heads are better than one.

**2** *heads are better than* **1**

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*General Manager - A. Sorley*

*Aerial view of B.E.R.L. Penarth Road Works, Cardiff*

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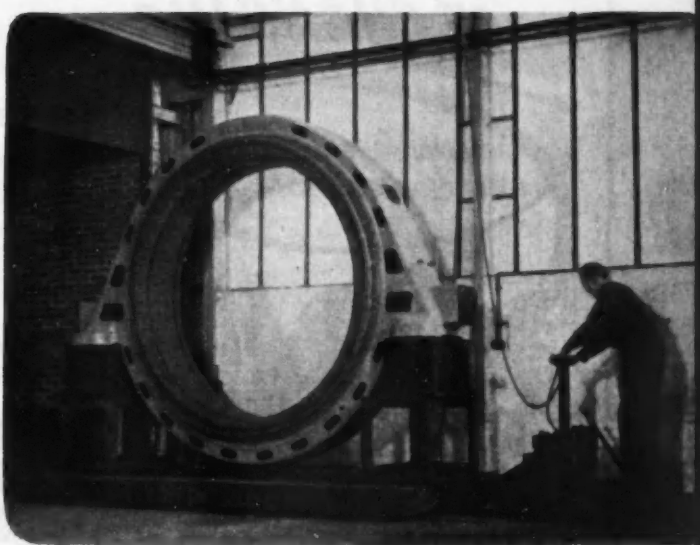
***Just one example of a medium-size rewind carried out at the Penarth Road Works, Cardiff***



*A 12-ton winder motor stator, after complete rewind, being placed in drying oven on 20-ton capacity power-operated oven bogey. Power unit detaches from oven bogey before door closes*

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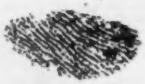

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*without tears... without tools!*

**AT LAST...**

here is a fused plug, complying with BSS. 1363, that enables fuses to be changed without tools. On pressing the hinged pin the fuse may be withdrawn by hand.

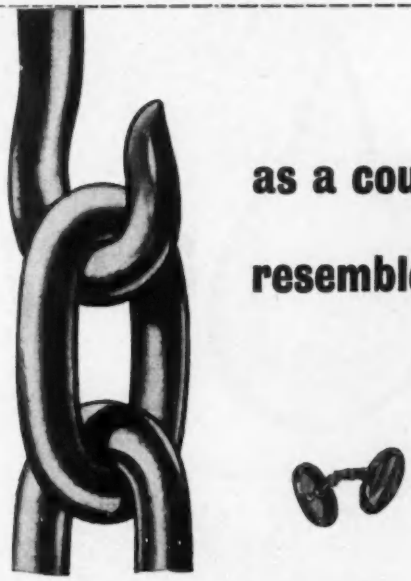
**CATALOGUE No. DS/16**

**See us at ELECTRICAL ENGINEERS' EXHIBITION EARLS COURT, MARCH 25-28**

*The* **DS FUSED PLUG**
TO B.S.S. 1363
*With the Patent Hinged Pin*
Patent No. 638780

*Manufactured by* **D.S. PLUGS LTD** MANCHESTER · 5

GENERALLY SPEAKING . . .



**as a coupling**

**resembles a cuff-link . . .**

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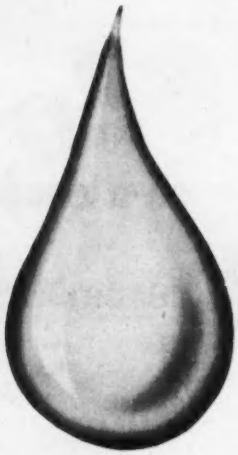
# Bandit  at bay!

Public Enemy No. 1 so far as the electrical engineer is concerned is moisture, and much has been spoken and written about this menace. The only observation we would make is that one of the grades of DELARON Laminated Plastic has such a low water absorption figure that we sometimes have difficulty in measuring it.

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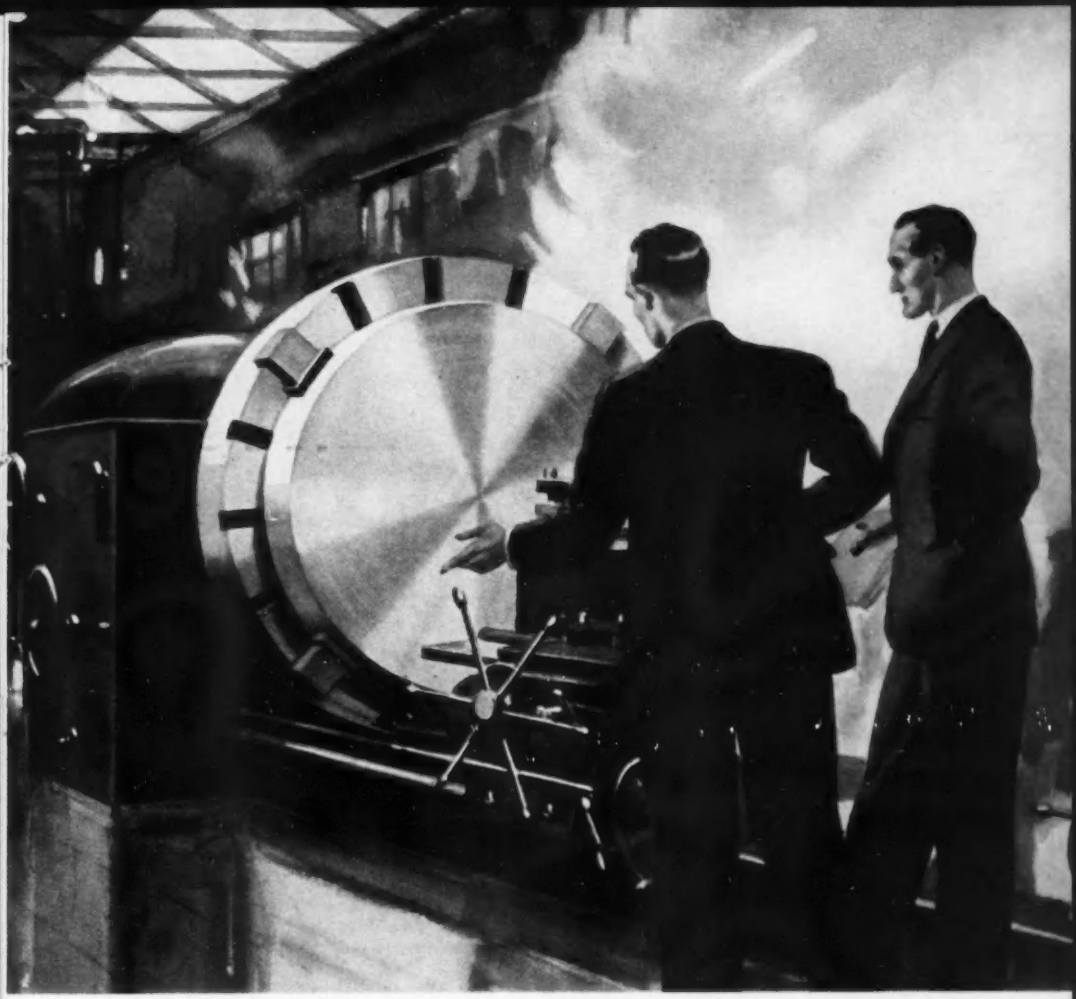

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Consult the C.P. Motor Application Research Engineer. He will investigate your problem and recommend the right motor for the job and the right method of speed control. Use this service in the development stage of your machine and it may save you time and money. It will place you under no obligation.

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*Motto: "Touch not the cat bot (without) a glove."*

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*Isomantles* *for*

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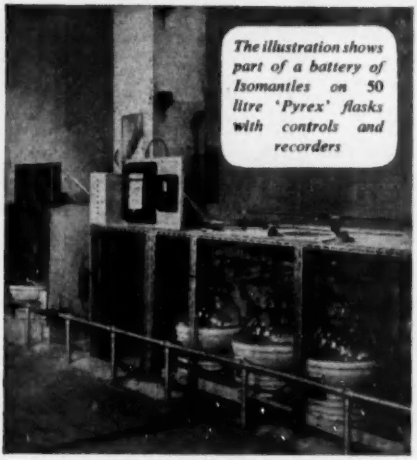

*The illustration shows part of a battery of Isomantles on 50 litre 'Pyrex' flasks with controls and recorders*

*By courtesy of Esso European Laboratories*

**ISOMANTLES have solved a great many problems involved in the heating of glass and metal plant to the full satisfaction of our clients which include many of the greatest names in British industry . . .**

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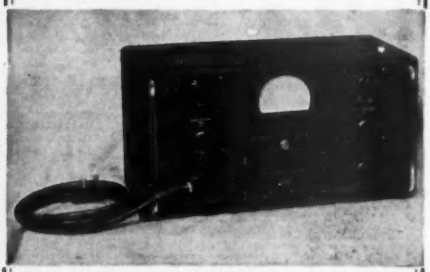

- **Cable Fault Location**
- **Wire Identification**
- **Depth Measurement**
- **Pipe Line Tracing**
- **Cable Routing**

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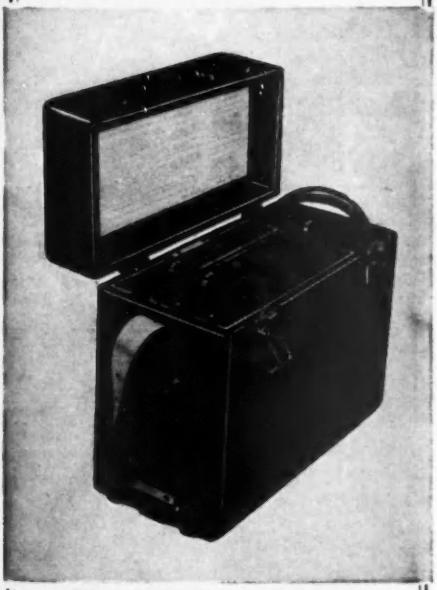

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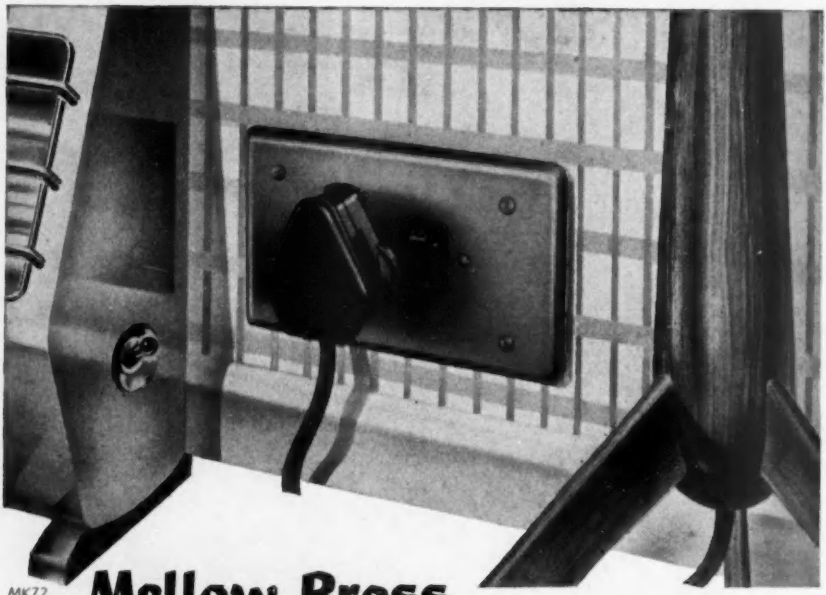


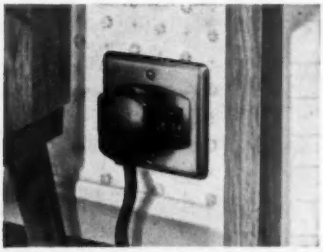
MK72

# Mellow Brass is back in the home

*2983/515. 15 ampere flush switchsocket-outlet. Finish: BMA*

IT IS GOOD NEWS that accessories with brass frontplates are at last back again. The solid brass plate is perfect for those installations where a little extra quality is demanded, for it has no equal where durability and handsome appearance are concerned. We are specially pleased because we are now able to offer some very attractive new designs. These MK switch-sockets have smoothly rounded bevel-edges and no sharp corners. We think you will find them very good-looking.

*All BMA designs listed in our 1952 catalogue (with the exception of pilot-lamp switchsocket-outlets) have now been reinstated.*



*2958/646. 13 ampere flush switchsocket-outlet. Finish: BMA*

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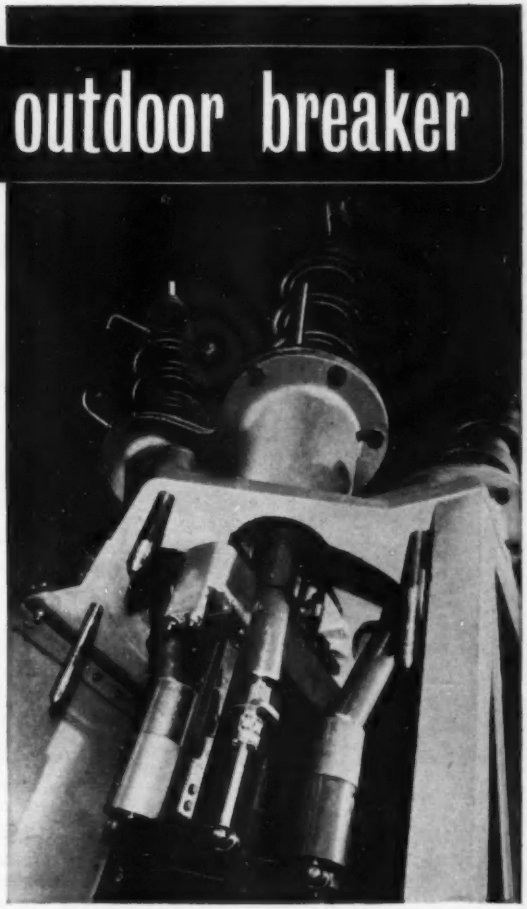

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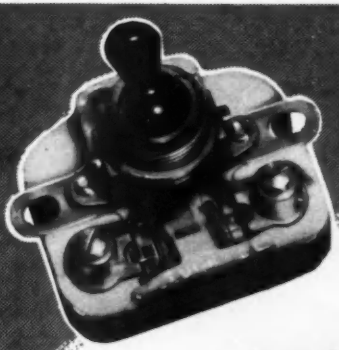

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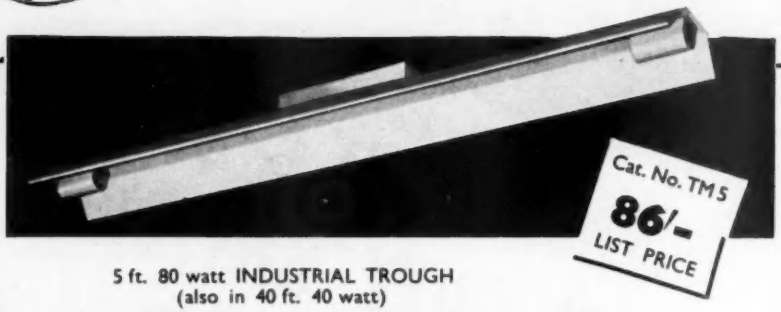


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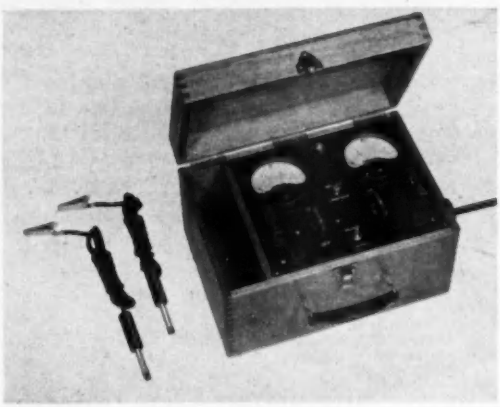

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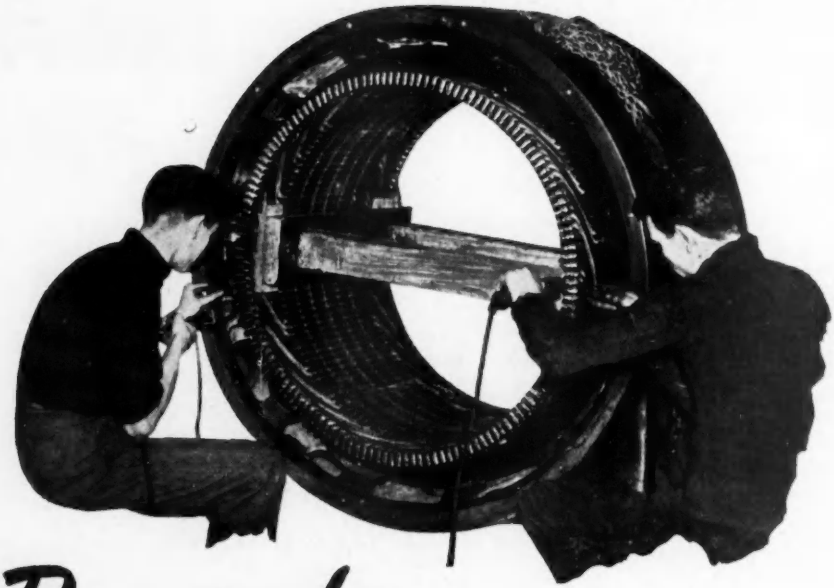

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# ATLAS Lighting

## for Coronation Year

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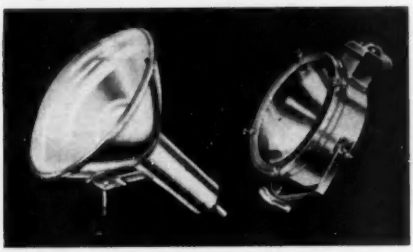
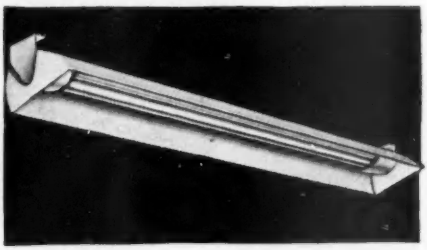
ATLAS fluorescent floodlighting offers you unique possibilities for the floodlighting of architectural or natural features. Automatic colour changing can be combined with static colour floods to produce breath-catching displays. We shall be glad to send you details.





### ATLAS INCANDESCENT AND FLUORESCENT LIGHTING

An illustrated leaflet AL/121 is available showing a range of ATLAS floodlights, spotlights and decoration lamps which you can specify for Coronation lighting. There are suitable ATLAS lamps in all sizes and voltages.

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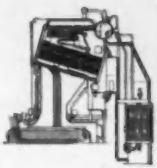

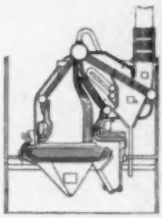

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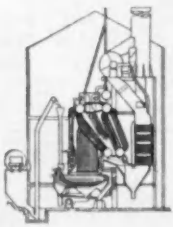
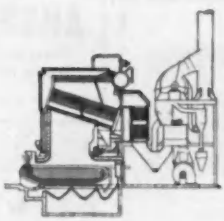
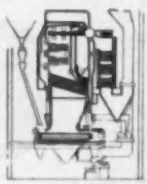
For every known design and size of water-tube boiler there is a highly efficient 'L' type travelling grate stoker.







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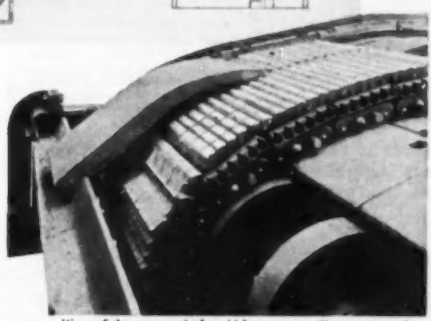

*View of the rear end of an 'L' type travelling grate stoker*

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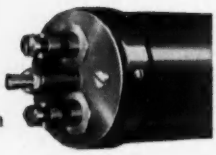

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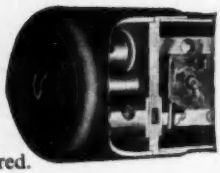

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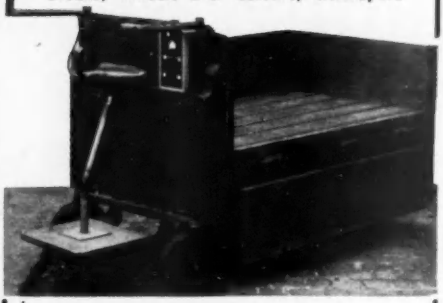

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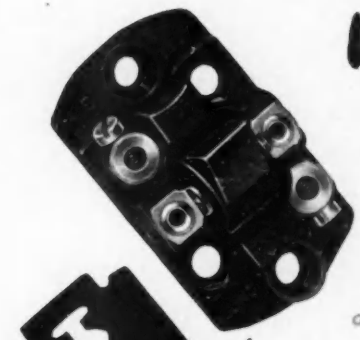

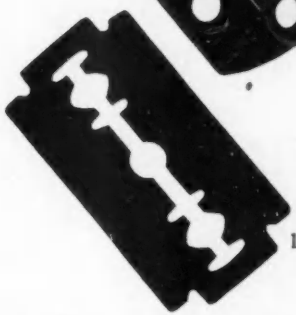

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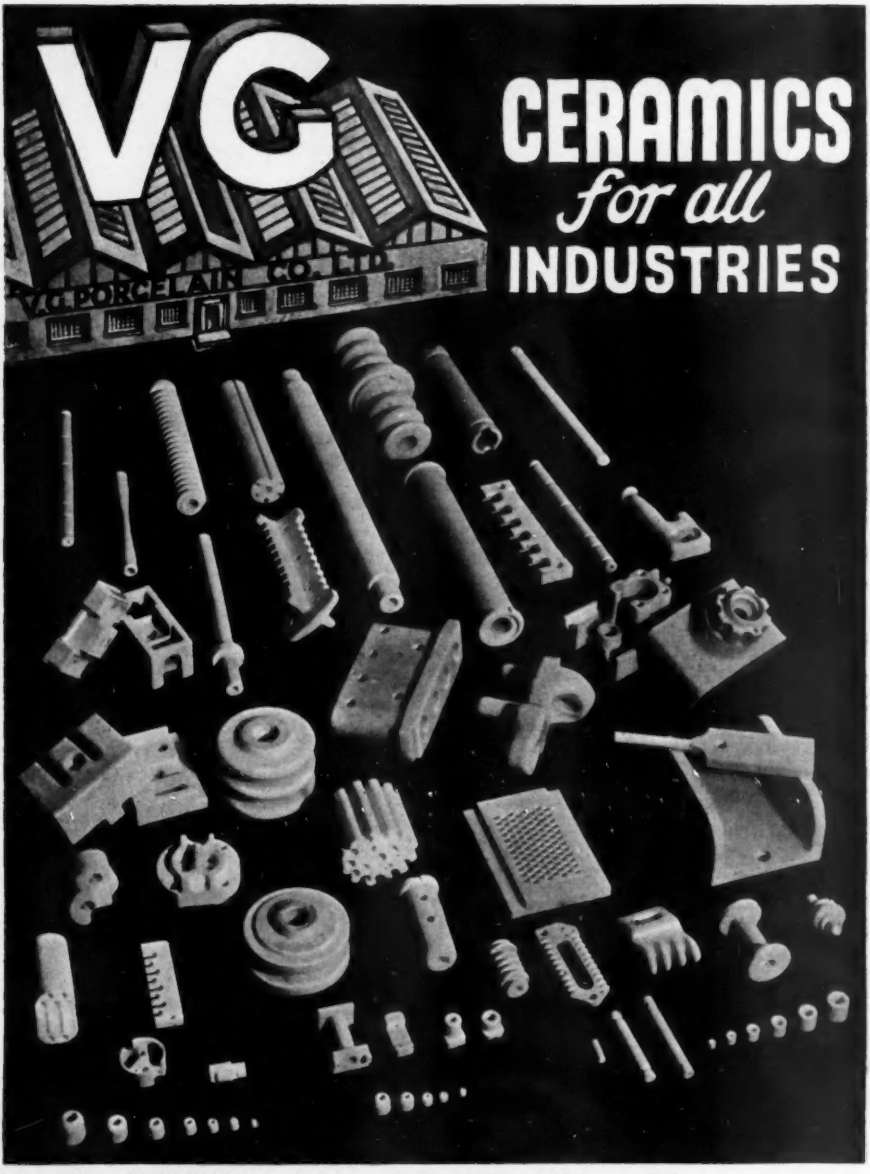


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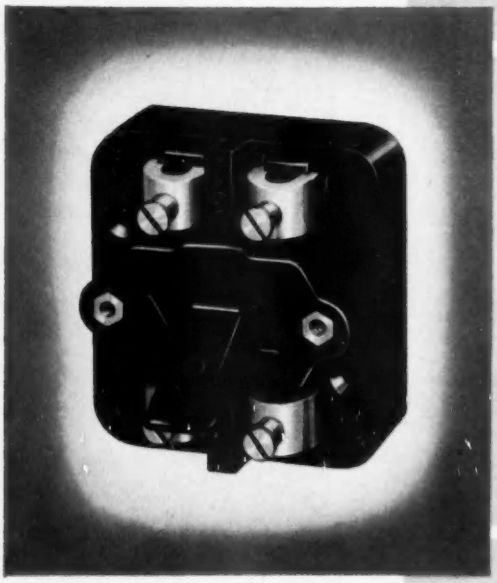

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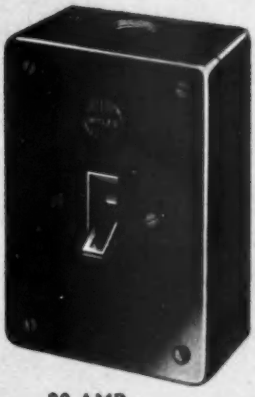

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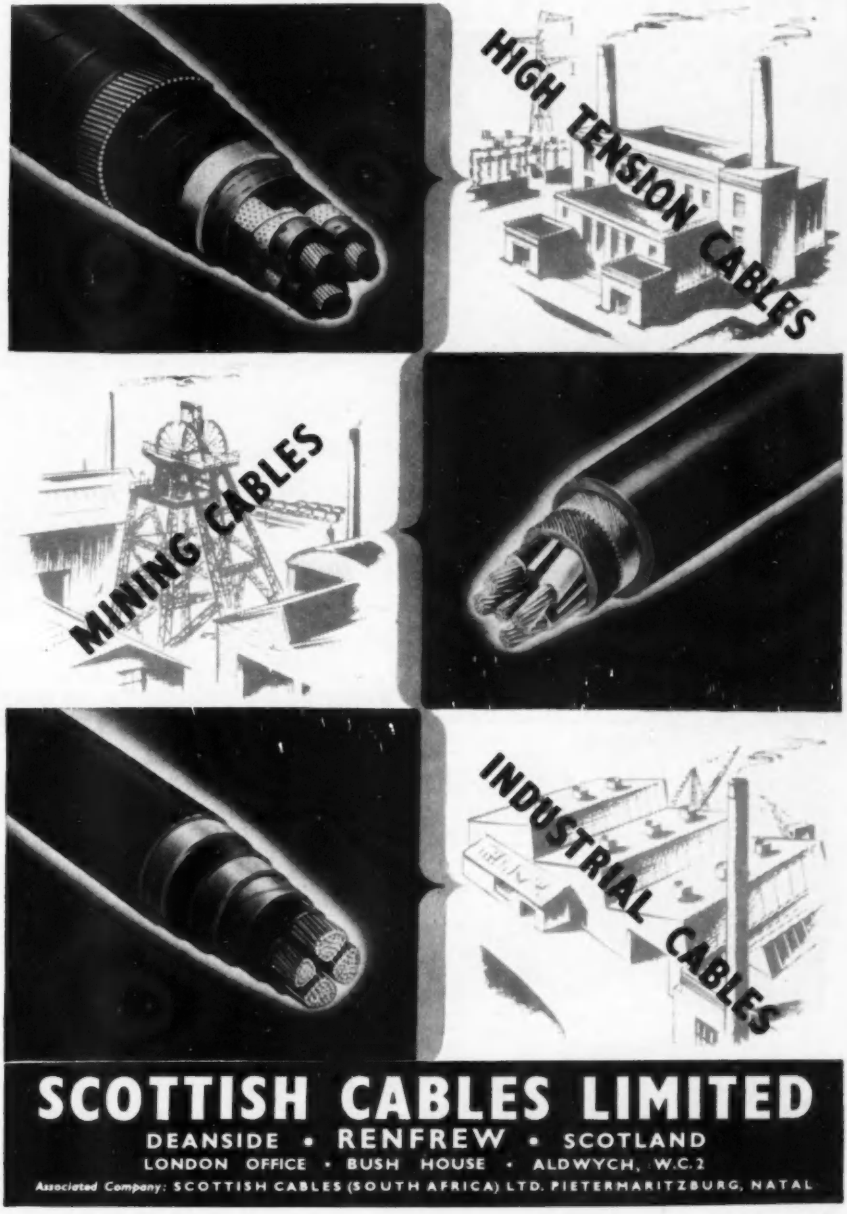


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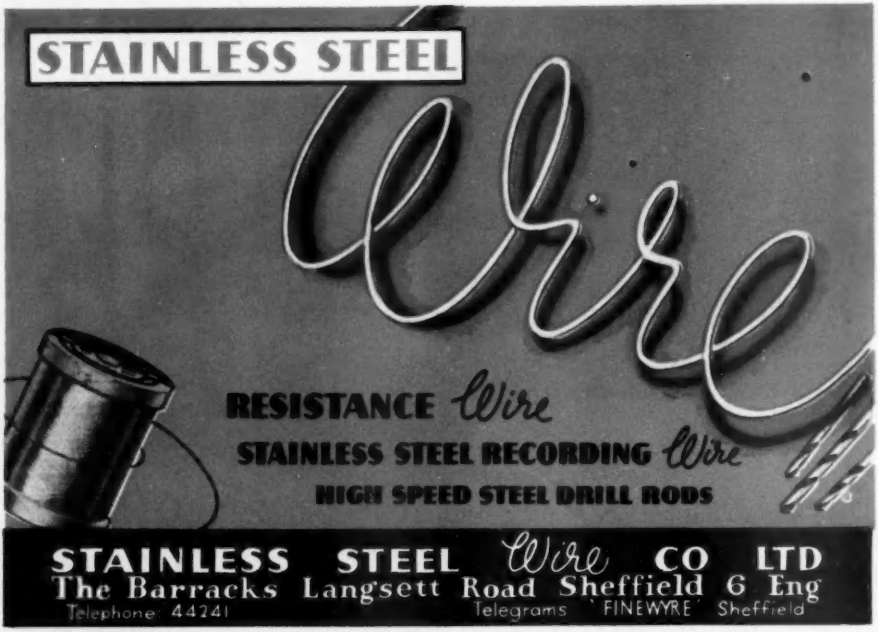


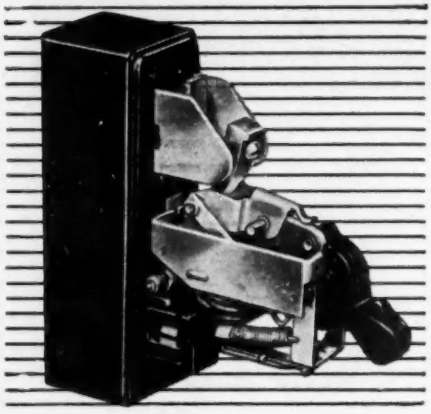

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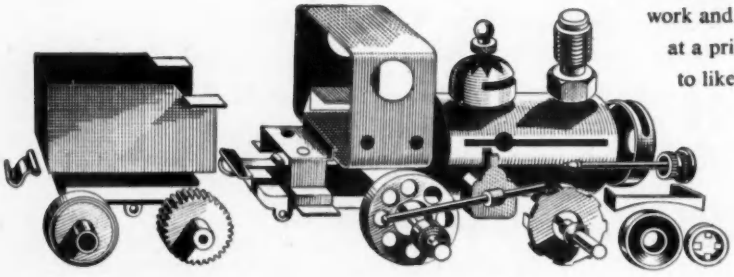

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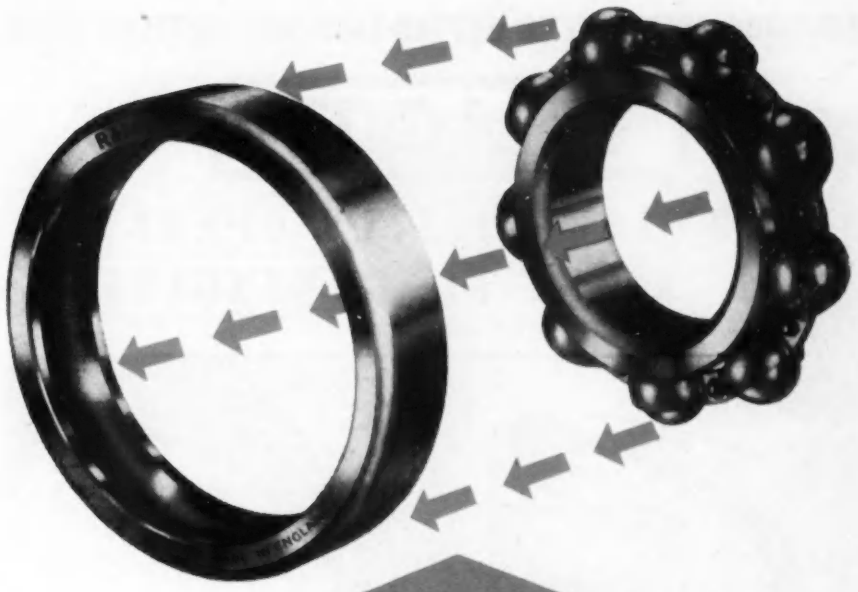

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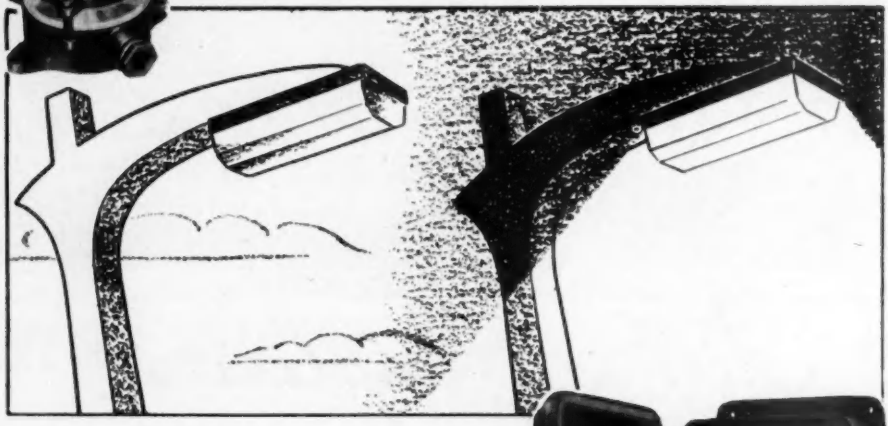

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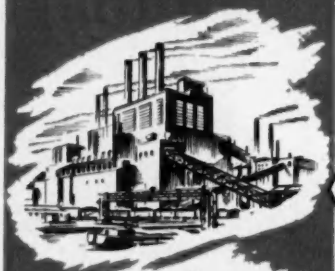

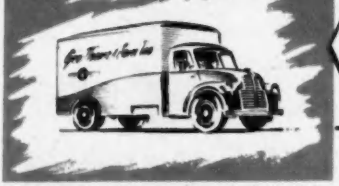

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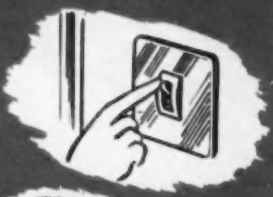

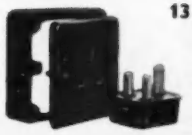

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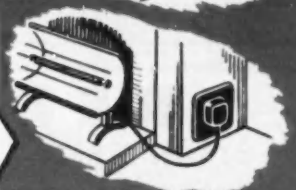

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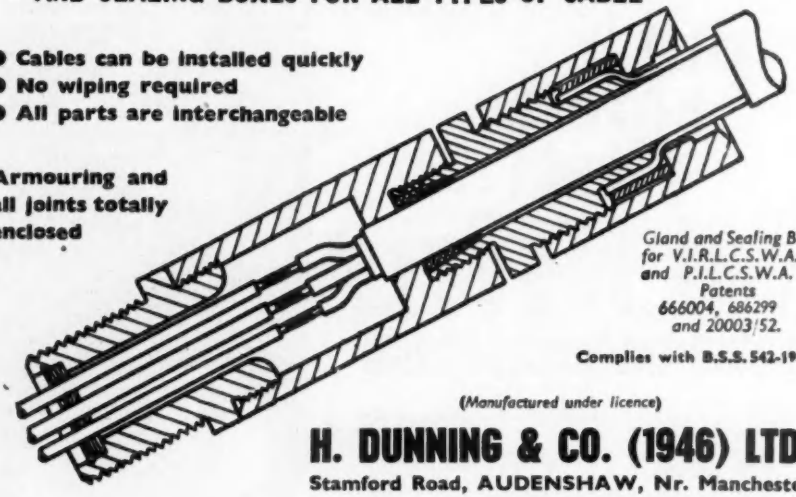

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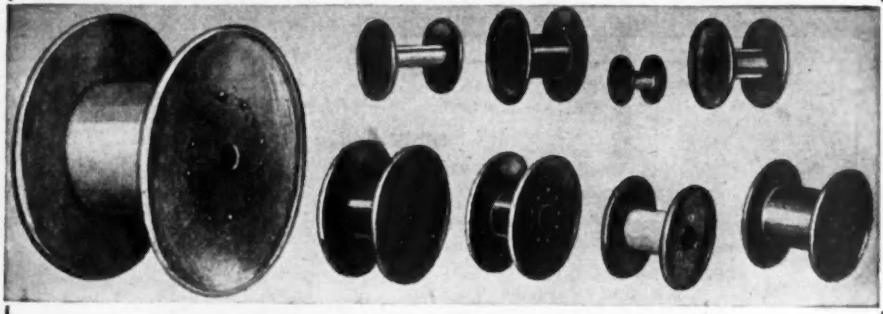

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# ELECTRICAL TIMES

Volume 123 No. 3202 19 MARCH, 1953

PUBLISHED EVERY THURSDAY



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ESTABLISHED 1891

**SUBSCRIPTION RATES**—United Kingdom and Overseas £2 10s. 0d. per annum. Canada C$7·50c., U.S.A. $7·50c. per annum. Subscriptions are payable in advance and may commence with any issue throughout the year. Overseas subscriptions may be paid to The Electrical Times Limited by banker's draft, cheque or international money order. Single copies are obtainable, price 9d. each.

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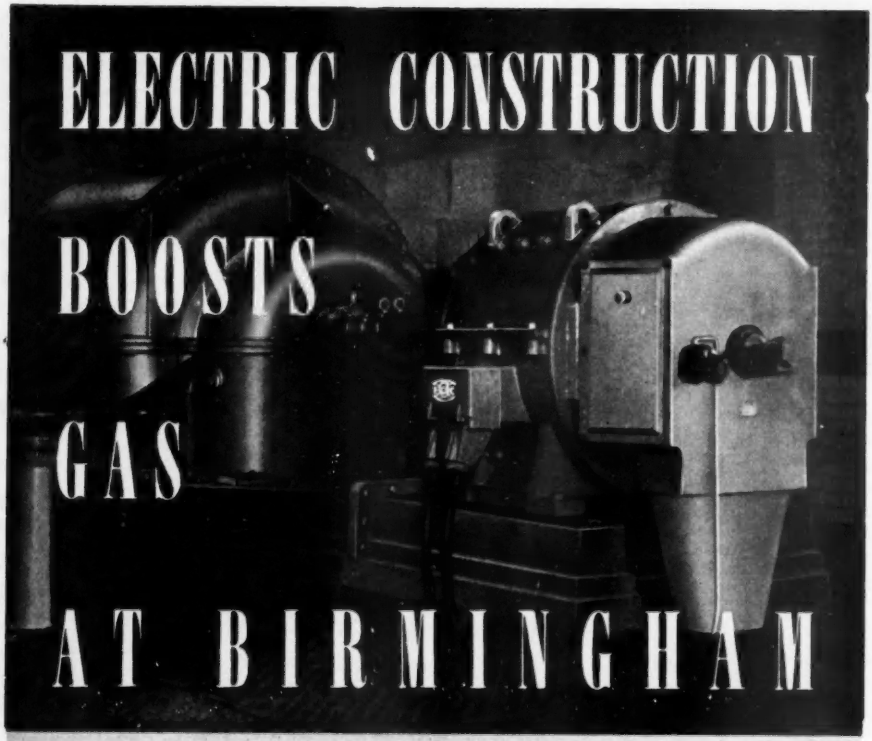
# ELECTRIC CONSTRUCTION BOOSTS GAS AT BIRMINGHAM



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# Editorial

## *THOUGHTS ON AN EXHIBITION*

THE demand for a purely electrical exhibition has been heard for many years now. It is a feeling that has grown in strength with the gradual decline in favour of the B.I.F. as a means of displaying electrical goods. Now it would seem that such an exhibition has arrived, almost overnight, without those earnest consultations, lengthy committee work and long-term planning that many feared were necessary to establish an exhibition of a magnitude adequate to one of the country's greatest industries. While it would be foolish to suggest that next week's display at Earls Court is of a magnitude fully representative of the industry, its substantial size is a major demonstration of the need that is felt for a wholly electrical exhibition. Having reached this present stage of development it would be unfortunate if the idea were dropped, yet clearly if such exhibitions are to grow to a size comparable with the stature of the industry, a substantial enlargement of the organisational structure will become necessary. This can only be achieved if full endorsement is given by the electrical associations basically concerned and this becomes a matter of urgency if it is to be done in ample time for preparations to go ahead for the next exhibition.

## *PROLONGED INJUSTICE*

THE retailer has been condemned to carry indefinitely the unpredictable business risk of changes in the rate of purchase tax. The official committee under Sir Maurice Hutton, which has been studying the question of tax-paid stocks, and on which such high hopes were originally set, has recommended that no compensation be paid when a tax is reduced. Hamstrung by its terms of reference, which called for equity "between the trade and the Revenue," the Committee has shied at suggesting any scheme of compensation involving a complicated task for officialdom. It has left as its only positive contribution to this difficult problem a polite suggestion that the Treasury should avoid large and frequent fluctuations in the rates of purchase tax on individual products, and that changes should in any case be announced only in the annual budget proposals. There is little satisfaction for electrical retailers here. Rates of purchase tax on most electrical appliances are already so high that if they change at all they must surely fall—and any such fall means a loss to the retailer. Tax is paid at the wholesale stage, and customers go on strike until any tax relief is reflected in a price reduction. The cold comfort that the Committee offers is the suggestion that traders should have taken a profit during the war, when p.t. was first applied. They say he should take it now if taxes rise. But the retailer cannot; neither can he, nor we, regard this as a morally satisfactory report. Though its convenience is guaranteed to appeal to any Government, we hope that its patent defects and rather cynical unfairness will prevent its endorsement as the last word on this complicated matter.

## *CRAMPED EXPANSION*

IT is axiomatic that production is at the heart of economic advance, and the very kernel of production today is electrification. The words carry an important inference: that in the planned rate for commissioning new generating plant in a country or a continent can be found the key to the probable economic progress of that area. On this basis the newly issued O.E.E.C. report on Europe's electrification plans for the five years up to 1956 makes anxious reading, for the overall rate is only 7% on a 1951 basis; and even this is unlikely to be achieved. America provides the obvious standard of comparison, and although that country is already well ahead of

Europe in terms of any likely parameter such as h.p./worker or kWh/head of population, the latest reports suggest that the aim there is 14% per year expansion. In the United Kingdom, in spite of many difficulties, something over 7% per year is planned. In so far as it is determined by industrial demand, the actual rate of expansion is, of course, limited by available investment funds, for electricity is essentially the necessary servant of production. Regarded from this point of view, a 7% per year increase indicates a lower rate of progress than many would like to see, and probably an under-estimate of the real need for electricity generation in Europe.

### *ACHIEVEMENT IN SCOTLAND*

WITH some hard things being said in the House of Commons last week about North of Scotland hydro-electric schemes, the H.E. Board's report for 1952 appeared at a useful moment for painting the credit side of the picture. Once more it is a record of steady progress in the organisation of electricity supplies for a thinly spread populace, with costs kept down by selling cheap hydro-energy at a profit to areas dependent on more expensive thermal generation. Some 290,000 potential consumers remain to be connected, and to bring supplies to them while paying its way is the hardest part of the grand design to which the N. of S. H.E. Board is working for they live in the remoter regions. Those responsible for this enterprise can take heart, however, in the ample achievement of the years since the Board was set up.

### *STANDARDS BY AGREEMENT*

IT is the boast of the British Standards Institution that it does not initiate standardisation. The engineering industries, with their long experience of such work, acknowledge the wisdom of this practice as a safeguard against the ideological temptation of standardisation for its own sake; but some interests now becoming directly affected by the widening scope of B.S. specifications are less content. In Parliament and elsewhere, there is a tendency to ask why standard procedure cannot be hastened by direct Government action, though it is significant that such suggestions are seldom backed by any detailed plan. An answer to such questioning comes appropriately from the present director of B.S.I., Mr. H. A. R. Binney. Yesterday he picked out the unique function which the Institution performs, by reminding a Royal Society of Arts audience that "standards do not come just from putting everybody's ideas in a pot, shaking it around, and coming up with an average." An agency capable of crystallising the best ideas, of composing technical differences, and of negotiating an equable settlement in regard to commercial interests is needed, and the B.S.I. Secretariat, with its guaranteed independence, fulfils just these functions. As with all democratic processes dependent on intelligent compromise, progress is seldom swift and is occasionally less than fair, but in general, the agreed document that results secures a width of acceptance that justifies such minor blemishes.

### *kW/BULLOCK*

A RECENT agency report from the Uttar Pradesh (India) Government claims that a machine has recently been invented which, made of indigenous materials and iron, is capable of generating 2 kW if driven by a goat, and about 8 kW if driven by a bullock or a camel. Such a claim appears to run somewhat counter to the N.P.L. Committee Report on "Utilisation of Solar Energy," where a "bullock-power" was regarded as being only one step removed from the steam locomotive. In fact, the committee went as far as to give a prime bullock (on a short-term rating of eight hours) a maximum output of 0·72 kW while an average bullock has a 24 hour rating of only 80 watts, with an overall thermal efficiency of about 5%. The comment of the edior of the circular letter of the Federation of Electricity Undertakings of India, with regard to the invention that "one is inclined to view this as over-optimistic," seems, therefore, to be justified. We are inclined to view it as utterly impossible!

*Meteor*

19 MARCH, 1953

R. L. C. TATE, F.R.S.A.
of the Lighting Service
Bureau writes about

# *LIGHTING the Shop Interior*

*THE RIGHT ELECTRICAL INSTALLATION CAN GIVE A VALUABLE BOOST TO RETAIL SELLING*

MOST shop windows are poorly lighted; almost all shop interiors are lighted very badly indeed. In fact it is not at all unusual to find a shop where the window lighting is excellent and has obviously been designed by someone who knew how best to use all the resources available, but where the interior lighting system looks as if it were originally installed in 1880, and has received very little attention since that date.

In the larger stores the lighting is often of a type more suitable for a large office or factory. Where filament lamps are employed, they are usually housed in enclosing fittings of the type normally seen in schools; fluorescents are often mounted bare on the ceiling, or in large pendant fittings arranged on a rectangular pattern. Mounted bare they look ugly, give a cold dreary appearance to the room, and very little light at counter level; arranged in rigid lines, they seldom bear any relationship to the goods displayed on the counters below, and being often the brightest objects in the field of view, tend to attract attention from the stock in trade to themselves. Bare lamp installations are not only unsatisfactory from the shopkeeper's point of view, but they do positive harm to the reputation of fluorescent lamps. Shopkeepers naturally judge a new type of lamp by the application with which they are familiar, and one or two installations of this type in a town are enough to put other shopkeepers off using fluorescent lamps for a very long time. If in addition, lamps are used whose colour-rendering properties leave much to be desired, a thoroughly dissatisfied customer is almost bound to result and a great deal of business may well be lost to the contractor.

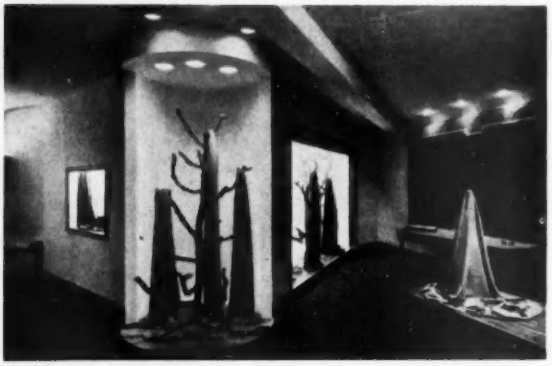
*Painting the ceiling dark blue and using strong down-lighting forces attention on to the goods in the shop pictured at the head of this page*

## *Designed to Sell*

When designing a shoplighting scheme one must never forget that a shop is not just a room which must be evenly lighted to a required intensity but a place deliberately planned to sell goods. The lighting must perform three functions—it must attract attention to the goods displayed, it must provide a good sales atmosphere and finally sufficient light must be provided at the salespoint, so arranged, and of such a colour, that customers can see to appraise the goods properly, so that they do not find on getting them home that they are not what they thought they were. These three "A's"—Appeal, Atmosphere and Appraisal, must each have its place in a well-designed shoplighting scheme, though the emphasis will vary according to the class of goods sold or the type of customers expected in the shop. Good lighting cannot make people buy if they are not

*On the left is seen the interior of a Bond Street shop, which has interest added by a false window at the back of an inner salon. In the picture below, the lighted feature at a corner of an awkwardly shaped shop attracts customers to the inner section*

in the mood to do so, but it can help to put them in that mood, and by providing a good "sales atmosphere" make them more ready to buy the goods to which it has directed their attention.



### *Mixed Lighting*

One of the commonest mistakes made by electrical engineers is to imagine that one ought not to mix filament and fluorescent lighting. In a shoplighting scheme efficiency, in the sense of producing the maximum light at counter-level for the minimum current consumption is less important than effectiveness. In other words a lighting installation which provides a good sales atmosphere and displays goods to advantage is to be preferred to one which does neither, even if the former is rather more costly to install and to run. In order to produce such a scheme, however, one must know something of the requirements of various classes of shop, and a study of the buying habits of customers and the effect of different lighting arrangements on various classes of goods is very well worth the trouble involved. A lighting scheme which is very effective in a bookshop, for example, may be quite unsuitable for a ladies' outfitters, and fittings which are quite in place in Mayfair may give quite the wrong impression in Camberwell, although the lighting principles behind the installations may be just the same. Whatever type of lighting is decided upon, however, the inviolable rule of shop-window lighting, that the lamps themselves must always be screened from normal angles of view is just as if not more important, inside the shop.

The most important thing in any shop is the merchandise, and it would, therefore, seem obvious that the first consideration is to provide a strong, attractive light both where it is displayed and on the counters where it is sold. Lighting of floor and ceiling is a secondary consideration, and, indeed, there is a tendency among contemporary designers to paint the latter a dark colour, to make it as unobtrusive as possible. If sales and display areas are brilliantly illuminated, enough spill light should be available to illuminate the floor sufficiently to avoid customers tripping over obstacles. Lighting fittings should be designed to illuminate the merchandise rather than be themselves prominent features of the decorative scheme. Far too many shop lighting fittings are designed to look attractive, when the last thing they should do is to draw attention to themselves and away from the shopkeeper's wares. It is a mistake to imagine that a bright fitting is needed to give a cheerful atmosphere; if the goods displayed are colourful, such an atmosphere can easily be achieved by means of lamps concealed behind opaque baffles. This is not to say that industrial types of fittings should be used, but quite often a very simply designed housing is much to be preferred to an elaborate confection in ribbed and moulded glass or perspex.

Decorative lighting fittings can indeed be used in certain types of interior, but if they are, they should be of low brightness, and used purely to produce an atmosphere of cheerfulness or luxury. This is often done by means of filament lamps in decorative pendant fittings, the basic lighting of the shop being provided by

fluorescent lamps in simple housings which completely conceal the lamps from view while directing their light on the merchandise and counters. A very simple and effective method of doing this in a long narrow shop is to mount ordinary cornice lighting fittings on the ceiling, facing inwards on to the walls in line with the front edge of the counters. These will light the counters and the walls behind them brilliantly, while leaving the middle of the ceiling comparatively dark.

### *Showcase Lighting*

Counter showcases are commonly found in a number of shops, including jewellers, tobacconists, ladies' outfitters and confectioners, but they are not always lighted. Lighting a showcase makes it at least twice as effective as when it is left unlighted, and it is not usually difficult to do. Because of their shape, fluorescent lamps are especially suitable for this purpose, and they have the added advantage that owing to their high efficiency they give a good light with very little heat, a condition where perishable goods are concerned. In some cases, however, it may be worth considering lighting showcase contents from above. This has several advantages, one of which is that goods taken out of the counter and laid on it are more brightly illuminated than before, instead of being seen in partial silhouette against the illuminated interior. If the showcase is internally lighted, a wooden or metal fillet must be used to conceal the lamp or lamps from view—external lighting means that an all-glass front can be used. Wiring through the floor to each individual showcase may set an awkward problem, which in overhead lighting will not occur, since the lamps are wired from the ceiling in the usual way.

### *Avoid Reflections*

A point which should be noted is that the lighting equipment, whether filament of fluorescent, should be lined up with the front edge of the counter-showcase. By this means annoying reflections in the glass top are avoided; mounting the lamps further back means that their reflections are bound to be seen by customers, and may even make it difficult for them to see the goods displayed inside. If filament lamps are used, it is suggested that they should be ordinary general service lamps mounted in dispersive reflectors with louvre rings. Reflector spotlamps are seldom suitable for this purpose, owing to their higher cost, which will make them uneconomical where they are used in large numbers, and also because of the beam of heat which travels with the light, and which may prove annoying to customers or salesstaff. They are, however extremely useful for spot-lighting special displays, as, owing to their compact construction, they can very easily be concealed behind beams, pillars or similar structural features.

The wall directly behind the counter is an area where special lighting can often be used to advantage. Many shopkeepers still use it merely as a storage-space which is readily accessible to the assistants, but there is no doubt that it can be a valuable display area since it is the direct line of vision of a customer standing in front of the counter, who may easily see something she wants to purchase while waiting for her change. If fluorescent counter-lighting is employed the fittings can often be arranged to light this area as well, but in some cases special lighting treatment is to be preferred. The use of a glass shelf with a pelmet concealing fluorescent lamps which light the wall above and below it is an excellent device, since goods may be displayed above and below it to advantage, and small objects may be stood

*The eye is led right into this shop by the fluorescent lamps mounted on battens spanning the ceiling*

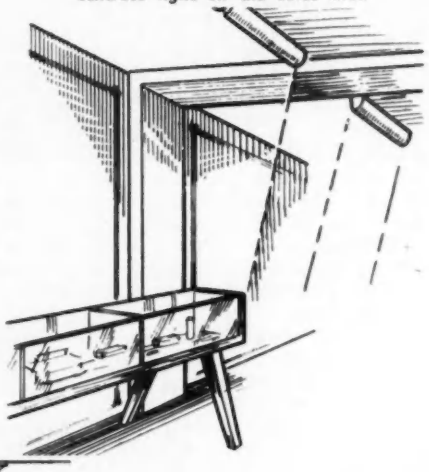
*In this small shop, fluorescent lamps provide general lighting, with filament lamps for spotlights*

On the shelf. Where existing glass-fronted showcases have to be lighted, it may be a great deal more difficult, as concealment of the lamps often poses an awkward problem. It is very common to see fluorescent lamps mounted vertically at the corners of such a showcase and either inadequately screened or not screened at all. Bare vertical fluorescent lamps are just as objectionable inside the shop as in the shop window, and where concealment is impossible, an alternative method of lighting must be considered. It is often possible to light such a showcase from panels with lamps behind them let into the floor and soffit. Another possible method is to use miniature shop-window reflectors with low-wattage lamps in them behind a pelmet or above holes cut in the soffit.

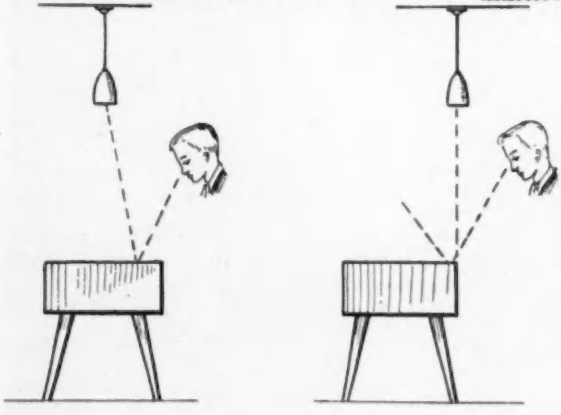
In addition to attracting customers' attention to the merchandise and providing good seeing conditions at counters and sales-points, lighting can be used to assist customer-flow in large stores and to attract them to little-used parts of the shop in awkwardly shaped ones. One way of doing this is to arrange lighted displays at strategic points, so as to attract customers' attention, make them approach to inspect the lighted goods more closely, and thus become aware of those parts of the shop which were not visible from the door. Another is to attract attention by a lighted "leader", or continuous lighted feature on the ceiling, which points to the way towards the inner parts of the store. Both methods can be used together with excellent results, but the second is probably more suitable for large stores than the smaller type of shop.

In an L-shaped room, a lighted feature on the corner will attract customers into an inner sales-room, by persuading them to go up to examine it more closely and thus see what is around the corner. Such features can take a variety of forms, from the simple display spot-lighted from the ceiling, to elaborate lighted showcases or model stands. When lighting free-standing displays inside a shop, great care must be taken to avoid glare from spotlights annoying customers on the other side of the display. Spot-lamps should be mounted as nearly over the model as possible, and should always be fitted with spill-shields to avoid a sideways view of the lamp.

*Fluorescent cornice fittings are used below to concentrate light on the sales area*



*Right and wrong (left) ways of placing fittings over a glass counter showcase are shown below*



Where there is an inner part of a shop, partially screened from it, but of which a part is visible from the front portion, it should be more brilliantly lighted than the latter, in order to attract customers' attention. In addition to the usual means of illumination, a false window could well form a feature of a room of this nature. Such a window is not difficult to make, and an excellent impression of distance can be achieved by painting the background pale blue and lighting it by means of fluorescent lamps hidden behind the window frame. If some flowers, a branch of a tree or something similar is put inside the 'window' an illusion of looking past them at a clear summer sky will be produced.

Painting the background with an imaginary landscape is not generally recommended, as however well-executed the painting, observers will be quite aware that it is a false window, owing to the convergence of their eyes upon it. It is, of course, absolutely essential to screen the lamps from view, as otherwise the illusion will be completely lost. It is surprising how a feature of this sort can help to turn a dull, dreary room into quite a pleasant and attractive one.

RESULTS OF COLOUR TESTS CARRIED OUT IN THE LIGHTING SERVICE BUREAU USING EXPERT AUDIENCES

| Goods Displayed | Lighting Arrangement Chosen | | | Remarks |
|---|---|---|---|---|
| | 1st | 2nd | 3rd | |
| *Bacon (cut) ... | F | — | — | |
| *Bacon (uncut) ... | M | — | — | |
| Biscuits ... ... | F.C/M | F | C/M | |
| Butter ... ... | F | — | — | |
| Cake ... ... | F.C/M | C/M | F | |
| *Cheese ... ... | C/M | — | — | |
| Chocolate and Confectionery | F/D | F | M‡ | |
| Curtaining Fabrics | F.C/M | C/M | F | Chiefly seen by daylight. |
| Cut Glass ... | F | — | — | No other type of lighting suitable. |
| Dress Fabrics ... | F.C/M | F | C/M | Chiefly seen by artificial light. |
| †Fresh Fish ... | F/D | F | — | |
| Furniture ... | F | F.C/M | N | High-class furniture looks best under F only. |
| Groceries (mixed) | F.N. | F | M.N. | |
| Jewellery... ... | F.C/M | F | — | No third arrangement satisfactory. |
| Sauces & Pickles | F.C/M | M.C/M | — | No third choice made. |
| Shoes ... ... | F.C/M | M.C/M | C/M | |
| Silver ... ... | F | — | — | No fluorescent lighting suitable. |
| Tea (dry and in the cup) | F | F.C/M | M.C/M | |
| Toys ... ... | M.C/M | F.C/M | F | |

* No second or third choices were made for these commodities.
† Test made before the introduction of Mellow and Colour-matching fluorescent lamps. ‡ Then an experimental lamp.
Abbreviations: F = Filament lamps. D = Daylight fluorescent. N = Natural fluorescent. M = Mellow fluorescent. C/M = Colour-matching fluorescent.

## *Colour Rendering*

The question of the colour-rendering properties of fluorescent lamps is one which is of especial importance to shopkeepers. That the light from filament lamps differs widely in colour from natural daylight is a well-known fact, but since it is not much less yellow than the light from former light sources, such as gas, paraffin lamps or even candles, people are capable of making mental adjustments for it—and indeed, refer to this colour of light as "artificial" as opposed to "natural" light. Unfortunately the light from most fluorescent lamps also differs in certain respects from natural daylight, with consequent distortions of the colours of objects seen under it. People are not familiar with these distortions of the colours of objects seen under it, so they are unable to make allowances for them, and since the general effect of the light from most fluorescent lamps is far more like natural daylight than that of the light from ordinary filament lamps they are all the more apt to be disappointed when they find that objects which they thought to be one colour, are, in fact, not quite the same.

As a result of repeated enquiries as to the best types of lighting for displaying various classes of goods, the Lighting Service Bureau has made a number of tests, tabulated above over the last four years. Most of these were made for bodies of retailers or manufacturers, some were made for individual firms or shopkeepers, some are the result of testing the reactions of specialist audiences to the appearance of various kinds of merchandise under different lighting arrangements. In every case the choice of illuminant was made by the persons who knew most about the goods illuminated; members of staff of the Bureau were not included in the people making the tests. It should be borne in mind that these tests are entirely subjective, and that what one group of people like, another may find intolerable, also that in some cases, such as that of the I.C.C.D., they were made some years ago, since when other lamps, notably the "mellow" and "colour matching" fluorescent lamps have been introduced.

*Fluorescent lamps on top of the bookcases provide general indirect lighting in this large bookshop*

These two lamps have made an enormous difference to the problem of the colour-rendering of light sources, especially the remarkably close resemblance of the light from the colour-matching fluorescent lamp to north-sky daylight, which has led to its selection for a large number of classes of goods. A point which should be noted is the number of cases in which a mixture of filament lamps and colour-matching fluorescent was the most favoured. Here the warm light from the filament lamp was felt to offset to some degree the rather cold effect of the colour-matching fluorescent alone, and, in addition, the filament lamp provided highlights and shadows which tended to be lost in the more even illumination of the fluorescent tube. For some classes of goods, notably cut-glass and silver, filament lamps were still felt to give a light superior to any kind of fluorescent; in none was any one fluorescent lamp alone considered to give the most satisfactory light for selling.

# B.S.I. INDEPENDENCE

PROVISION of an independent forum within which organisations and individuals who want industrial standards can hammer out their arguments in the presence of adequate representation of all the industrial, professional and commercial circles likely to be affected by the final decision: that is the job of the British Standards Institution. This description is used by Mr. H. A. R. BINNEY, C.B., Director and Secretary of B.S.I., in a paper which he presented yesterday to the R.S.A.

However, although B.S.I. officials cannot adopt partisan roles, they have much to do with the successful completion of any particular standardisation project. They ensure an adequate technological appreciation of the problems involved, provide a practical service of fact finding, and bring to the committee meetings concerned a wealth of experience in negotiation and the art of informed compromise.

At present, about 60% of the work of the B.S.I. is directed to the engineering and metal trades, about 30% to chemicals and building together, with 10% to other industries.

Mr. Binney suggested that much more could be achieved in the way of standardisation to aid productivity. Commenting on the productivity team reports, he said that nearly all of them recommend the more extensive use of standardisation techniques in this country as a prime source of economy, and hence of manufacturing efficiency and competitive power.

After touching on international aspects of standardisation, the paper turns to the question of standards and the consumer. Recently the range of British Standards with which the retail shopper is directly concerned has been much extended. But the principle of voluntary standardisation remains. No industry is compelled to adopt quality standards or a marking scheme, and no individual producer in an industry which supports a policy of standardisation need regard himself as bound by it.

The reputation of the B.S.I.—both here and in other countries—rests on the integrity and far-sightedness of those many industries which have provided the driving force and expertise of the B.S.I.

# Our readers' views . . .

## New Interference Sources

WE would like to refer to the letter from Mr. John Baggs of Oldham, in the 12th March issue of the ELECTRICAL TIMES, on the subject of interference with radio and television reception from flashers used to control the lighting of zebra beacons.

We consider that it should be known that the flashers manufactured by us comply with B.S.S. 800, and have been fully approved by the General Post Office for efficient suppression. Tests have shown that no interference will be experienced from these flashers even after a year or so's wear when, as Mr. Baggs states, the contacts may become pitted.

It may also be of interest that every flasher is being individually tested before despatch, on G.P.O. approved radiation interference test equipment, to ensure that no Venner flasher will be guilty of spoiling radio or television programmes.

*J. H. Rawlings*
Asst. Sales Manager

VENNER LTD.
NEW MALDEN

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## Registration in South Africa

IN the 15th January 1953 issue of the ELECTRICAL TIMES on page 119 under the heading "Registration in South Africa," an article appears which might be construed that the scheme for controlling the activities of Electrical Installation Contractors involving the registration of contractors and wiremen, is something new.

This registration of contractors and wiremen is not new in South Africa as far as many of the larger towns are concerned and as far back as prior to 1936 East London had its own Regulations governing the Registration of Electrical Installation Contractors and the Licensing of Wiremen. Since then the South African Institute of Electrical Engineers has compiled "The Standard Wiring Regulations for the Wiring of Premises" and this standard has been adopted by many of the larger Municipalities in South Africa. This particular book deals with the standard required for wiring work carried out on premises. In so far as the licensing of wiremen is concerned, this is covered by the terms of the "Electrical Wiremen and Contractors' Act No. 20 of 1939" which makes it incumbent that only a Licensed Wireman can carry out wiring work on premises in determined areas.

Dealing with the regulations governing the registration of electrical installation contractors, although East London and many other towns have had Regulations governing such registration, as far as I understand, it is considered desirable that such Regulations be standardised throughout the Union and it is with that object that the Special Committee to which you refer has now circularised a final draft of the proposed Regulations.

The two publications above referred to, i.e. "Standard Regulations for the Wiring of Premises" and the "Electrical Wiremen and Contractors' Act No. 20 of 1939," can be obtained from the South African Institute of Electrical Engineers, Kelvin House, Johannesburg and the Government Printer, Pretoria respectively.

*A. Foden*
M.I.E.E., M.I.Mech.E.

EAST LONDON
SOUTH AFRICA

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## Service Centre Staff Grades

WHAT is the use of asking for well-trained Service Centre Staff, while the Area Boards only offer General Division Grade for Service Centre Assistants? These Assistants are expected to have a wider range of knowledge than clerical staff, and should be paid accordingly.

*"Sercen"*

LONDON

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## USE OF SILICONES

TRENDS in equipment design are naturally towards improved performance and economy in size and weight, and progress in this sphere may be said to depend largely on heat stability in insulating materials. Electrical equipment insulated with silicone products may now be operated continuously at temperatures up to 200° C. An exhibition showing the use of silicones in the electrical industry has been arranged by the Midland Silicones, Ltd. in co-operation with a number of well-known electrical concerns.

The exhibition is being held at 19 Upper Brook St., W.1. It opened on Tuesday and continues until March 21.

# NO REBATE ON P.T.

## *Official Committee burden of tax-changes on retailers*

FOR many years retailers have canvassed the opinion that they should be compensated for their losses when the rate of purchase tax on goods they hold in stock is reduced. Their argument is that public demand and the effect of competition makes them reduce prices at once; and since the tax is paid at the wholesale stage of distribution, they incur a loss equivalent to the drop in tax.

The Committee which the Chancellor of the Exchequer appointed to review this matter has now issued its report, a lengthy document* which is bound to disappoint many traders. In the view of the Committee, no such compensation should be paid; the tradesman should, if possible, cover himself by selling at the old price until stocks are exhausted. At the worst, it is considered, he will recover the necessary replacement cost. Equally no duty should be charged on goods in the hands of retailers, which have already borne tax, if the rate is increased.

### *Possible Schemes*

In reaching its decision, the Committee considered various schemes which would permit a rebate to be given (or a surcharge made) on goods in stock when the rate of tax is changed. Always it reached the decision that the arrangement would be unfair either as between one trader and another, or between retailers and the Crown; or else, that the schemes would be too complicated. As the Committee's terms of reference demanded that any proposed arrangement should be "practicable and equitable," this disposed of the matter.

It is pointed out in the report that the practice of no compensation has for long applied to dutiable commodities such as beer and cigarettes (Mr. Gladstone is quoted on the subject), and has caused little difficulty. The different position as regards purchase tax is attributed to the greater frequency of changes of rates, and the habit of changing them at times other than the budget. The tax on refrigerators, for instance, has changed six times since 1940. An improvement would be to make the changes in P.T. at any one time on any class of goods relatively moderate, and in general to make such changes only at the time of the budget so far as at all possible.

Other recommendations are that official assistance should be given to schemes formulated by retailers and their suppliers for deferred delivery of goods ordered by a retailer in the period before a possible reduction in P.T. Moreover, the use of such arrangements as sale or return contracts, by means of which tax is not paid until the retailer needs the goods, should still be permitted, though care should be taken to avoid abuse and evasion of tax.

Two possible schemes were considered. The first is "split delivery" as practised by tobacconists, whereby a firm order is given for delivery as soon as possible after a budget statement, and stocks are reduced in the pre-budget period. This might involve further official consideration of facilities for holding untaxed stocks of chargeable goods on the retailers premises, or else nearby.

The "sale or return" method is more obvious in its workings, but the agreement on which it is based has obvious differences from a contract for sale, and introduces difficulties from the seller's viewpoint. Furthermore, a workable scheme is required to enable the Customs and Excise department to check on the actual quantity of untransferred stocks at the time a tax-rate is changed.

### *Lost Opportunity*

In their general comments on representations received from trade associations, the Committee state that they did not find the case put forward for compensation from the Exchequer as strong as its advocates maintained. They recognise, however, that when purchase tax was introduced in 1940, the majority of goods to which the tax applied were price regulated. It was stated at the time that it was not permissible for prices to be marked-up by retailers. As a consequence, retailers did not then recover their replacement costs: recently some doubt has been thrown on this interpretation of the law.

The Committee considered the possibility of introducing a limited scheme of compensation for traders who were in this way officially prevented from charging replacement costs when prices were raised, but they decided that the complications of administering any such plan were prohibitive.

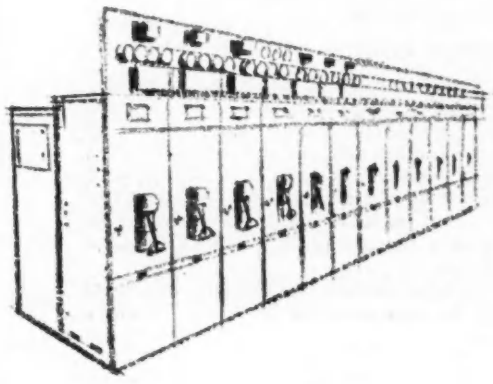
* Report of the Committee on Tax-Paid Stocks. H.M.S.O., price 1s. 9d.

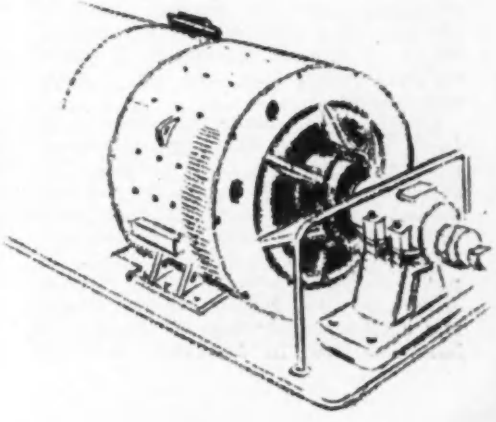
# Exhibiting Electrical Engineering

FROM a small electrical exhibition organised in 1950 by the N.W. London branch of the A.S.E.E. came the idea of an electrical engineering exhibition on a national scale. Taken up by the Association's London Regional Council, the idea bore fruit last March at the Horticultural Hall, where it met with a favourable reception. It is from these beginnings that this year's exhibition has grown. With Earls Court as the venue, exhibitors now number 107 compared with 58 last year, and the duration has been extended from two days to four. One could hardly wish for a better success story.

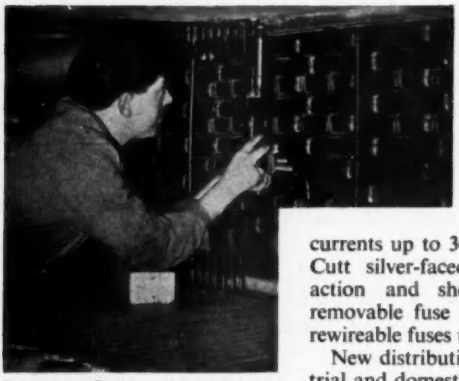
A major attraction of the exhibition will be the "Illumination Way," a 200-ft feature displaying, in three lines, fittings of different manufacturers from those for gasfilled lamps to unit neon fittings. Commercial cooking has been made a second feature, in addition to which there will be the industrial manufacturing stands. This is not all, for a competitive spirit has been introduced with awards for the best domestic and industrial labour-saving ideas.

The exhibition will be officially opened at noon on Wednesday, March 25, by Sir John Hacking, deputy chairman, B.E.A. The hours of opening are from 10 a.m. to 7 p.m. Wednesday to Saturday, March 28; admission by invitation or by showing trade cards.





# Review of Exhibits at Earls Court



*Crompton Parkinson's "Nelson" stud welder in action*

DEVELOPMENTS in supply and distribution plant have necessarily been paralleled by industrial utilisation equipment, until today the installation engineer is confronted with an extensive range of gear to suit particular tasks. An indication of that range opens this preview of the exhibition and it is succeeded by a similar treatment covering the wide field of other activities in electrical engineering represented at this exhibition.

Present-day needs of industrial consumers have demanded of the distribution equipment manufacturer units which can be readily extended to cater for increased demand. Under this category the Simplex Electric Co. Ltd. is showing for the first time their new "Regent" switchgear panel. The bus-bar chamber is provided with parallel bars arranged to take a variety of slideable connections, a special clamping method being used for all heavy current joints.

Cubicle type switchboards, exhibited by G. P. Dennis Ltd., feature special back-of-panel mounting h.r.c. fused switches. The operating handle of the switch protrudes through the panel in an elongated slot, fitted with a duralumin shutter to exclude dust. Access to the switch is through a door in the panel, interlocked with the switch position. Among individual switches being shown is a new addition to the range of Dorman and Smith Ltd., their "TS" fused switch. Rated for currents up to 300 amps on a.c. or d.c. it has Cutt silver-faced contacts, a double break action and shock-tested mechanism. The removable fuse carriage takes h.r.c. fuses or rewireable fuses up to 60 amps only.

New distribution equipment for both industrial and domestic purposes is being shown by Sanders (Wednesbury) Ltd. Prominent on their stand is their new "Sandasteel" fuseboard, in which the aim has been to obtain lightness whilst maintaining maximum rigidity in the structure. Using their "Duplex" fuse carriers for h.r.c. or rewireable fuses, the board allows adequate wiring space for circuit and main cables.

Standardised unit construction of switchgear has several advantages for the manufacturer and provides opportunities for compact design whilst maintaining sufficient access for maintenance. Varilectric, Ltd., are displaying representative examples from their current production of cubicle switchgear built on this principle to demonstrate the main constructional and assembly features. Astral Switchgear, Ltd., are exhibiting their "Astral" range of distribution fuse boards for rising main or terminal cables, for either surface or semi-recessed mounting.

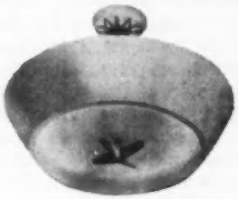
## *Switch Gear*

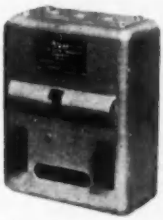
Typical air-insulated switch gear for primary distribution purposes being shown by Johnson and Phillips Ltd. is their type "AG 16" oil circuit-breaker unit. Of the vertical isolation pattern, the unit may be fitted with either a plain-break c.b. rated at 150 MVA at 6.6 kV or 11 kV, or the higher rated arc-control breaker having a capacity of 250 MVA at the same voltages.

A further example of distribution equipment can be seen exhibited by W. T. Henley's

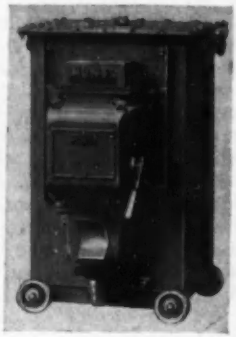
(Below, left) Mercury switch, shown by Wandsworth Electrical Mfg. Co.
(Right) Hunt's p.f. correction capacitor

(Above) Ceiling rose shown by Agro Electrical and below, Ediswan's new circular fluorescent fitting





(Above,) is Chilton Electric Products Ltd.'s "Atlas" domestic circuit-breaker



Telegraph Works Co. Ltd., who are showing a group 24 distribution pillar. To facilitate close inspection of constructional details, typical pillar units are being displayed on separate mountings.

### *Consumers' Control Units*

In the domestic sphere, there has been an increasing trend toward the consumer control unit as standard distribution equipment. Such units are featured by Mantel Metalworkers Ltd., who are showing models based on their "Zedlok" method of construction, Four to eight fuse ways can be provided with either cartridge or rewirable elements controlled by one main switch together with meter and service cable termination. Switchfuse control units are also being exhibited by G. H. Scholes and Co. Ltd. Forming part of their "Wylex" range, these units are of the all-insulated metal-clad type with rewirable and cartridge fuses which may be assembled in any number up to 8-way.

Combined distribution units for either large or small domestic installations are prominently displayed by Chilton Electric Products Ltd. Based on their type B earth leakage circuit breaker rated at 60 A at 250 V a.c./d.c., the units incorporate earth leakage, overload and short-circuit protection. The smaller type, designed for use with appliances rated less than 3·5 kW, has provision for five fuse ways, none greater than 15A. All components are mounted on the base, fuses being accessible through the cover.

Modern control gear has to cater for the diverse nature of industrial requirements. One of the features shown by J. A. Crabtree and Co. Ltd., is a recent addition, their Type B.15 air-break starter, which like their oil-break models is constructed on the unit method. Main contacts are of silver, the moving section being silver buttons on U-section arms recessed into the face of the traverse. Connections to the coil are made through phosphor bronze strips engaged with contacts on the coilformer, thus obviating the need for loose wiring. A range of sizes up to 15A is available. Thermal overload protection is provided with each.

George Ellison Ltd., are also showing a selection of their motor starters, complete with a demonstration of the operation of their "Bantam" 20A model. This display is designed to show the working of its over-current release mechanism and the triple-action time lag.

### *Distribution Systems*

Of local distribution systems for workshops and assembly lines, many engineers favour overhead busbars. Exhibiting such equipment, G. M. Engineering (Ottery St. Mary Ltd.), have a short length of their 3-phase trunking on view, cut away to expose the busbars. Tapping points, at 2 ft intervals, together with plug-in boxes indicate the ease with which supplies may be provided at almost any position. For supplying portable tools and appliances where freedom of movement forms an essential requirement, Electro-Mechanical Supplies Ltd., are displaying their trolley feed systems, of which the "Uniduct" rail is a typical example. This type of overhead busbar trunking can be used to provide a 3-phase supply for small tools through a trolley connector which runs along the length of trunking.

Both special and standard sections of cable trunking are being exhibited by the Davis Sheet Metal Engineering Company Ltd. These are shown fitted with their "Quick-fix" detachable covers, designed to reduce installation time, an important aspect where labour costs are high..

Conduit and conduit fittings are regarded as such a commonplace item in installation work that it is often surprising to realise the variety of grades which may be needed for some purposes. Of topical value are special weatherproof units shown by Walsall Conduits Ltd., whose value, in view of the considerable number of temporary lighting displays in hand for the Coronation, will surely be appreciated.

## *Busbar Chambers*

Essential components in high current distribution systems busbar chambers take a prominent place in the display given by W. G. Walker and Co. (Engineers) Ltd. Rated at 500A, their chambers are constructed of 16 s.w.g. mild steel sheet, using rust-protected screws throughout; using porcelain insulators to support hard-drawn copper bars.

Post-war developments in installation methods have resulted in several new methods of low power distribution systems of which the catenary system has proved of value in industrial lighting applications. In the exhibition the "Enfield" grid suspension system, introduced by Enfield Cables Ltd., has been installed in Illumination Way. Running the entire length of the hall in several lines, this system supplies all fittings displayed in this avenue.

Using collapsible pneumatic tubing for electrical installations introduced a new technique to the contracting industry, examples of which are being shown by the Ductube Co. Ltd. This company features their "Ductube" pneumatic tubing for use where concrete is cast *in situ* either as a structural floor or as a final screed over other types of flooring. Tubing is laid along wiring runs and inflated before concrete is poured. On setting, the tubes are deflated to permit their withdrawal, leaving smooth holes in the concrete through which cables may be subsequently drawn.

For hole boring in masonry, regarded often as a necessary evil in installation work, Rawlplug Ltd. are exhibiting new process "Durium" drills in range of sizes for their "Rawlplug" fixing accessories. Designed for use in hand-operated or powered drills, there are few locations in which they could not be applied to remove the arduous nature of driving holes in masonry by hand. Moreover, the claim of silent operation makes them particularly valuable in hospitals and sanatoria.

## *Wiring and Power Cables*

Exhibits of cables and wiring demonstrate the rapid and extensive development made in recent years in plastics. Two varieties now most common are polythene and p.v.c., and as cable insulation these are being exhibited by the Telegraph Construction and Maintenance Co. Ltd. Despite their value for use with power cables working at pressures up to 11 kV, their application to general wiring, control and low power cables, shown in this display has provided the engineer with an insulating material capable of withstanding considerable abrasion and resistant to oils and acids.

British Insulated Callender's Cables Ltd., are displaying a range of cables insulated with silicone rubber. This material is now being rapidly developed for use in applications where thermoplastics may not be suitable, and examples of heat-resisting cables, for working up to temperatures of 120° C may be seen.

Also for use where other insulators are likely to prove unsuitable are mineral insulated copper sheathed cables, to which Pyrotenax Ltd., are devoting a considerable part of the exhibit. Cables of this type, available for use in lighting or power circuits, may be used in agricultural or exterior applications where resistance to corrosion and other forms of attack is an essential requirement.

## *Cold Welding Technique*

Cold welding technique in cable manufacture demonstrates the effectiveness with which aluminium sheathing can be fitted to cables, as shown in the range featured by the General Electric Co. Ltd. Newcomers to this company's range of products, their aluminium sheathed cables offer the installation engineer an attractive alternative to the well-known lead covered variety.

Domestic wall switches are in such general and everyday use that to the casual observer their variety of design often passes unnoticed. Some indication of this diversity may be gained from the range of switches exhibited by the Britmac Electrical Co. Ltd., of which their short break a.c. switches illustrate that particular needs dictate such design variations. Newcomers to accessories made by the company, these switches resulted from a desire for switches silent in operation for general use where absence of noise is essential.

Newly introduced by Ashley Accessories Ltd. is a range of quick make and break switches including the "Duo-Base" development, consisting of two universal switches mounted on one base.

A further proof, if any were needed, of the general rule that different designs develop to meet particular requirements is provided by the "Tenby" range of flush surface switches being shown by S. O. Bowker Ltd. These are fitted with their "Autajust" mounting, a self-adjusting anchorage system designed to ensure that the switch locates itself correctly.

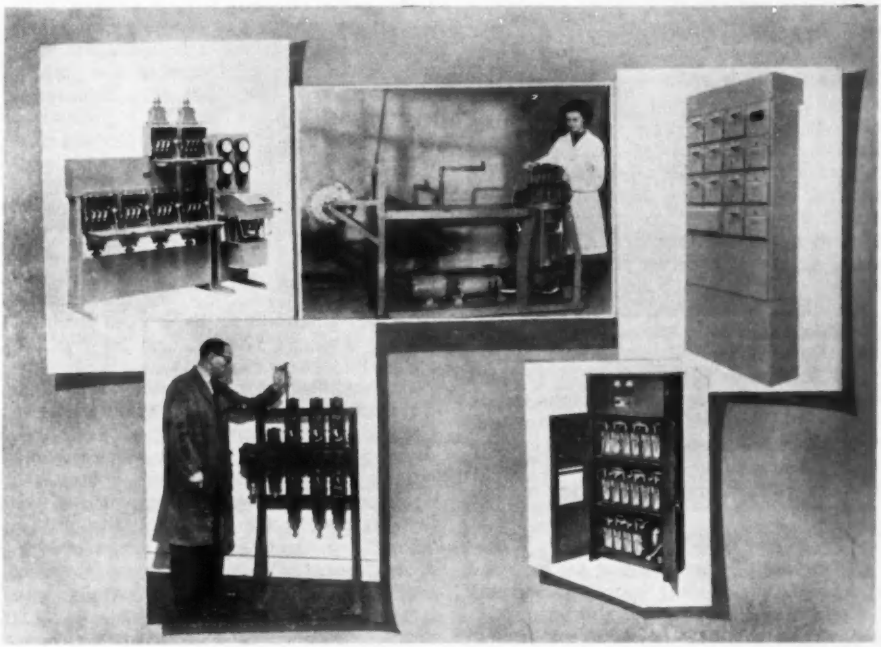
Exterior lighting displays for the Coronation demand fittings and accessories impervious to adverse climatic conditions. Designed to meet these requirements are some new accessories displayed by Nettle Accessories Ltd., among which is found their combined striplight cable and rubber lampholders for festoons of lighting.

A ceiling rose having provision for earth connections is among wiring accessories displayed by Ranton and Co. Ltd. Known as their "Gregg" model, this accessory is based on the socket outlet principle, the lead to the fitting being connected to a three-pin plug. This is held in the socket by an outer cover which screws on to the base of the rose.

The common denominator of all wiring accessories is the provision of adequate safety precautions, particularly to guard against danger to inquisitive children. Featured by M.K. Electric Ltd. is their "Snap-action" shuttered socket outlet, which they illustrate in their exhibit. In combination with their "spring-grip" type socket contact, this shutter forms part of the major safety devices incorporated in this company's accessories.

Although lampholders are such commonplace accessories, attention to detail distinguishes the well-designed product. Provision of substantial block-type terminals, for example, in those exhibited by Agro Electric Co. Ltd. make a case in point, where strength and reliable connections are essential requirements.

A novel feature of exhibits shown by Clang Ltd. is their ejector-plug, recently awarded the Seal of Guarantee by the Good Housekeeping Institute. Aimed at ensuring easy and smooth withdrawal, the plug is provided with a centre plunger which is pressed when the plug is to be removed. As the need to wrench the plug is



*Upper left: Standard G.M. Engineering switchgear and distribution board of type being shown. Upper centre: British Electrical Repairs' small armature coil winding machine. Upper right: neat and attractive, this is Varilectric's cubicle pattern switchboard. Lower left: Simplex miniature flameproof switchboard and busbar chamber. Lower right: emergency lighting cubicle—the Tudor Accumulator Co.'s "Safetylyte" unit*

removed, possibility of damage to the socket is consequently minimised.

Among their range of accessories J. H. Tucker and Co. Ltd. are exhibiting ceiling pilot indicator units up to 30 amps capacity. Available for either domestic or industrial use, these units, complete with ceiling switch, ruby lamp indicator and ball joint conduit fixing, provide a convenient method of controlling appliances where the installation of a direct hand-operated switch is undesirable.

Kersons Manufacturing Co. Ltd. are showing examples of their industrial accessories, among which are watertight protected switches designed to meet requirements involved in the control of exterior lighting fittings for illuminating factory yards and roadways.

A convenient method for supplying several appliances simultaneously is reflected in the triple socket outlet being shown by New Day Accessories Ltd., with its advantages over the unfused multi-way adaptor generally in use. Provided on one plate are two 2-amp sockets for lighting or radio and a 13-amp socket outlet for power supplies, with fused plug, together with a fused-spur terminal at the rear of the unit.

## *Mercury Switches*

Requirements to safeguard against fire in hospital operating theatres have been satisfactorily met in the sparkless mercury switch, of which their latest range is shown by the Wandsworth Electrical Manufacturing Co. Ltd. One such accessory provides for both main and emergency lighting, being designed so that switching on one of the two automatically switches off the other. Although both may therefore be in the off position, only one can be closed at any one time.

Few engineers condone the use of voltage test equipment with inadequate protection against faults, and a new voltage tester featured by the Martindale Electric Co. Ltd. provides safeguards essential against such contingencies. Using shielded prods and heavily insulated leads, the tester incorporates fuses and current-limiting resistors, whilst the scale is viewed through a magnifying glass to facilitate reading.

## *Power Appliances*

Greater use of electric power for increased productivity has resulted in the development of many types of appliances. One example of productivity aids is to be seen demonstrated by Crompton Parkinson Ltd., who are featuring Nelson stud welding, and indicating its value as a time and labour-saver. Automatically controlled, the welding "gun" is claimed to handle a variety of studs, pins and other fasteners for end-welding on to steel.

One of the oldest and most valuable sources of power which can be applied almost universally is the electric motor. One of their 2½ b.h.p. squirrel cage a.c. machines is prominently displayed by the Electric Construction Co., Ltd., showing in detail the component parts in a form of exploded view. The Jeary Electrical Co. Ltd. is similarly featuring motors, but of the fractional h.p. type, and, more particularly, geared motor units.

## *Small Motors*

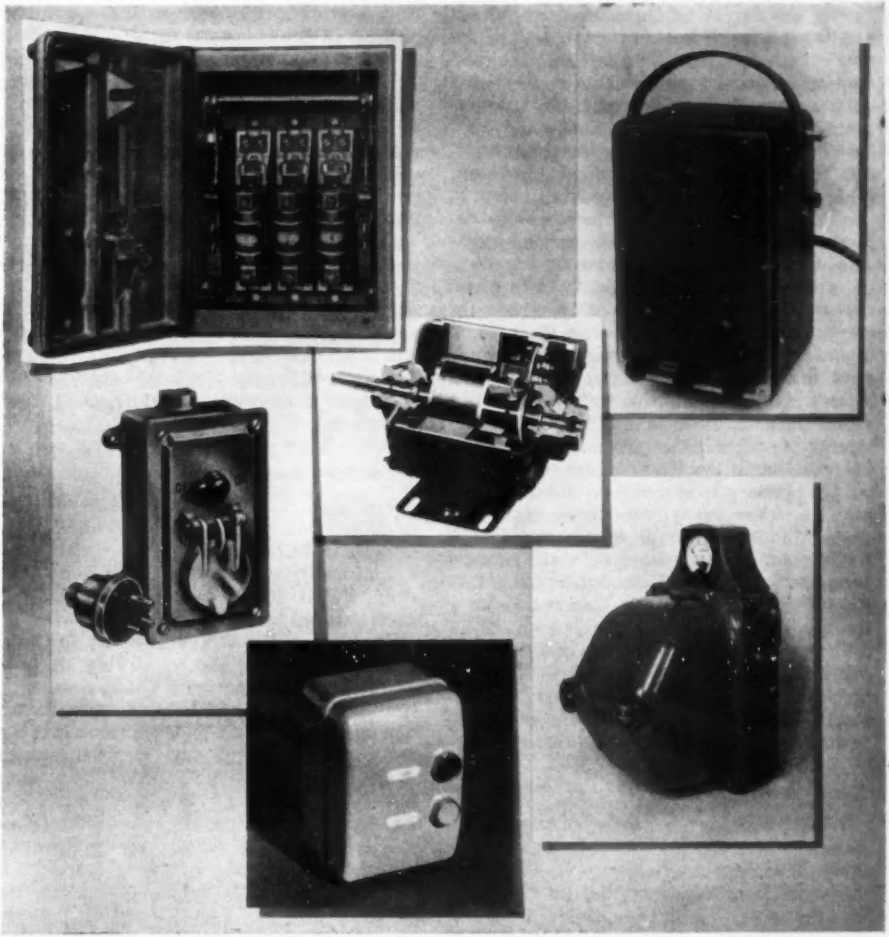
Small motors find a variety of uses, not only in industry but giving their power ultimately for the benefit of the housewife. This is to be observed on the Delco-Remy-Hyatt stand, where can be seen their type 625 split-phase motor, introduced into England last year. Although designed for almost universal application, motors of this type should be of particular value to the domestic appliance manufacturers.

Examples of the useful application of electric motive power in industrial appliances are to be seen in the industrial air-blowers and vacuum cleaners shown by the Service Electric Co., Ltd., whose portable blowers, fitted with hot-air attachments, have been used in factories affected by flooding at the beginning of February. For drying out and blowing dust from machines, these appliances may be adapted for use as vacuum cleaners.

Repairs to rotating machinery are a necessary part of engineers' work to ensure that electrical power may be used to maintain high productivity. In this activity is included armature winding: a machine for this purpose is being demonstrated by British Electrical Repairs Ltd., as one example of facilities offered by them throughout the country.

From the desire for tandem brushes on large d.c. machines, was developed, by the Synthetic Carbon and Engineering Co., Ltd., a new design of tandem brush holder, being featured by this company. Their brush holder is a departure from previous design, each of the two pressure fingers bearing on the brushes being independently sprung, also underslung. A new form of push-pull lever is used to adjust each spring, and as these are identical, provision is made to ensure correct pressure on each finger.

Of the problems associated with the use of electrical motors, that of lubrication ranks as one of the most outstanding. To this end,



*Top left, new Dorman and Smith fused switch, fitted with h.r.c. fuses. Top right, Pullin's portable capacitance resistance bridge. Centre left, weatherproof switched socket outlet being shown by Wellall Conduits Ltd. Centre, sectional view of Delco-Remy-Hyatt's split-phase motor. Lower centre, Crabtree's new type B-15 air break starter. Lower right, a new metered starter by Electric Construction Co.*

Lancashire Dynamo and Crypto Ltd. are showing a working model of the L.D.C. oil lubrication system for ball and roller bearings. This system, whose development was finally completed last year, is now being supplied on larger types of this company's motors.

Applications of electric motive power in the home include the electric clock, examples of which are being shown by T.M.C. Harwell (Sales), Ltd., taken from their "Temco" range of synchronous clocks. Among these is found their model 3797 in which is incorporated a 24 hour fully automatic alarm. Indication of the alarm setting is given by a third hand with a small panel showing either a.m. or p.m.

Found in as great a diversity as motors, transformers have an equally important part to play in the utilisation of electric power, whether as power transformers in the grid network or as low voltage units for local use. As a special application of the latter, Partridge Transformers Ltd. are showing their low voltage unit for lighting or portable electric tools.

Constant attention to insulation oil forms a necessary adjunct to the use of transformers. A unit designed for oil-testing purposes forms

part of the display of Gresham Transformers Ltd. Operating at voltages up to 50 kV, the unit comprises essentially a test cell, enclosed by a perspex cover, with which is incorporated voltage control and a miniature circuit-breaker. In the same field, Gulf Oil (Great Britain) Ltd. are exhibiting their "Acitest" unit for testing transformer oils to provide a rapid indication of the oil's condition.

Although many industrial motors are designed for three phase supply, there are occasions when only a single phase supply is available. Conversion from single to three phase may be the only method to utilise power; for this purpose the Westinghouse Brake and Signal Co., Ltd. are demonstrating their static phase converter, using it to power two 3-phase motors from a single phase supply.

An increased use of electrical power in industry to effect higher productivity brings in its train supply problems to ensure that the supply network is efficiently utilised for that purpose. Remote control equipment displayed by Standard Telephones and Cables Ltd. illustrates the application of their Common Diagram System to distribution control, with emphasis at sub-area level. Designed to cater for twenty substations with up to ten 6·6-kV feeder breakers each, the control desk exhibited offers facilities for a full control of all circuit-breakers, indication of all isolators, demand meter readings, centralised alarm indication and transformer tap control and indication.

## *Emergency Supply*

Where breakdown in supply is likely to have serious consequencies, some provision for emergencies becomes necessary, as that being shown by The Tudor Accumulator Co., Ltd., who are exhibiting an automatic lighting set. Having an associated battery of 14 Planté-type cells mounted on a double tier stand, the set operates on the Tudor "Safetylyte" principle and is being demonstrated continuously.

Converting equipment, much in demand for public supply and other purposes, is being shown by the Nevelin Electric Co., Ltd. Featured on their stand is the recently introduced Nevelin single anode mercury-arc rectifier, which is being demonstrated in a three-phase rectifier cubicle containing three of the first types now being produced. This equipment is designed to show the anchored cathode spot under load conditions, the anchoring being the outstanding feature of the rectifier.

It is further desirable to obtain the maximum value from available generating capacity, in any supply system, which involves among other considerations, the maintenance wherever possible of a high power factor. This aspect of power supply is being demonstrated by A. H. Hunt (Capacitors) Ltd., who are showing various types of p.f. improvement capacitors, ranging from 0·25 to 100 kVAr. By way of practical illustration, they have working exhibits designed to show the advantage of power factor improvement, and how this may be effected by automatic control.

Correction of power factor must apply equally on a local scale, as demonstrated by the use of capacitors in fluorescent tube circuits, and a prominent part is being given to capacitors for this purpose by the Telephone Manufacturing Co., Ltd. Staged by their components division, they are displaying a collection of their most recent types of these capacitors.

## *Heating Appliances*

Few in the electrical industry doubt the value of electric heating, and as an indication of the importance of this application, there are to be found several new appliances of which a box oven shown by Barlow Whitney, Ltd., is exemplary of industrial applications. This oven is designed for drying out welding electrodes after storage and before they are to be used. Having a capacity of 270 lb, each unit is fitted with an adjustable temperature control and constructed to facilitate electrode stacking.

Electric water heating has many advantages to offer over other types, and in this field are also to be seen new appliances. Introduced for the first time, Santon Ltd. are showing their "Otter" immersion heater, in which is incorporated temperature control. Elsewhere in the exhibition, Gillott Electro-Steam Cookers, Ltd., are featuring their "Duo Coil" immersion heater, provided with a variable temperature control. The heating element is their Standard embedded metal sheathed type which may be bent in a suitable jig to almost any shape to simplify installation in smaller or special sized tanks.

In contrast to heating by immersion methods, a band-type heater for external fixing is displayed by Hedin, Ltd. Intended for domestic use, the band heater has been designed for fixing round the standard cylindrical hot-water tank found in many houses.

Despite the wide range of domestic water heaters Aidas Electric, Ltd., are exhibiting, their type U.T.C. of 3-gallon capacity intended primarily for commercial use should prove of considerable interest. Its value lies chiefly in its comparatively small size, which enables it

to be installed close to the washing sink in licensed premises, restaurants, or other places where hot water may be required constantly only for short periods.

### *Space Heating*

Side by side with water heating lies the space-heating appliance, whose advantages have been the subject for much bitter controversy. Very few exhibits of these appliances are to be seen, but among those exhibited by E. K. Cole, Ltd., is found their "Thermovent" space heater for both industrial and domestic purposes. For use in the latter sphere are either one- or two-kilowatt models, each provided with thermostatic control.

Another method of space heating is shown by Isopad, Ltd., who will be displaying their "Isopanel" infra-red heaters. Isopanels used as infra-red radiators, burn at black heat aimed at ensuring maximum safety against fire risk. A comparatively large radiating surface is designed a high degree of heat comfort whilst raising air convection currents.

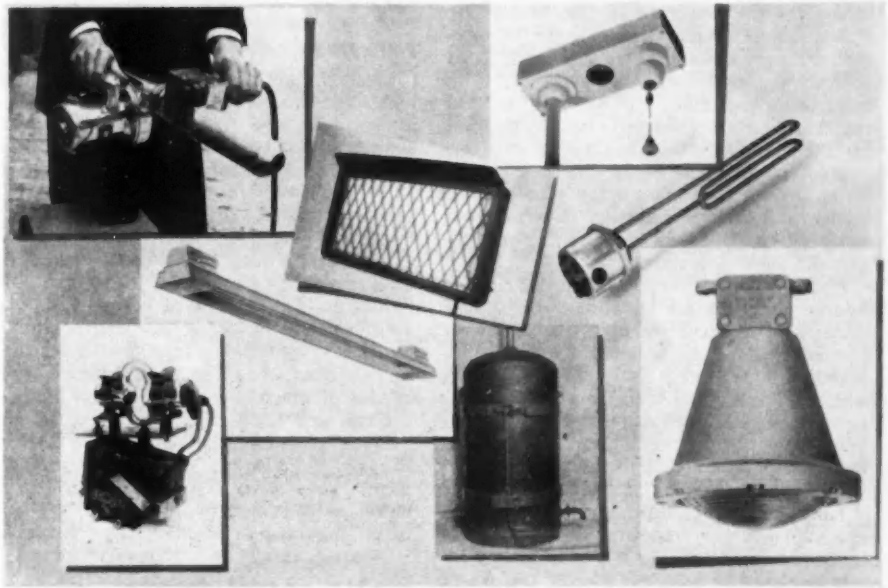
Henry Wiggin and Co., Ltd., are showing a new addition to their "Bright-ray" range of nickel alloys for electric heating elements. Designed for use as in electric furnace elements, the new alloy, Brightray F is recommended in preference to Brightray S for operation up to 1,000° C, in certain applications. These are where the furnace atmosphere is carburising or of a nature to set up "green-rot" in the heating elements.

### *Lighting Fittings*

Lighting fittings take so many forms that any comprehensive review, even if the necessarily limited range which is to be seen at the exhibition, becomes impossible. Among special fittings designed for particular applications is to be observed flameproof fittings shown by Holophane Ltd. Designed for use in areas in oil refineries or chemical works where Groups II and III inflammable gases are likely to be present, their Class B unit is representative of their range of this type. Using 200 W lamps, it provides an asymmetrical light distribution 25° from the vertical. Although arranged for pendant suspension it can be fitted to permit recessed ceiling mounting.

Provision of adequate lighting for industrial

*Upper left, "Secomak" portable air blower with heater attachment, on Service Electric Co.'s stand. Upper right, Ceiling pilot indicator unit, showing lamp glass, switch and conduit unit, exhibited by J. H. Tucker. Centre left, "Ediswan" industrial fitting for cold cathode fluorescent lamps. Centre, black heat infra-red space heater, a recent development shown by Isopad Ltd. Centre, right, Santon's "Otter" controlled immersion heater. Lower left, Mercury relay unit model, being exhibited by Londex. Lower centre, Band heater, by Hedin Ltd., fitted to a standard domestic hot water storage tank. Lower right, 'Holophane's flameproof industrial fitting*



purposes has resulted in the development of continuous lines of trunking along which fluorescent fittings can be fitted at the required intervals. Universal lighting trunking manufactured by the British Thomson-Houston Co., Ltd., of which a 9 ft run is being shown, demonstrates that it may be used to provide additional services of which the company's "Clearcall" loudspeaker system is one such service incorporated in the trunking.

Another lamp gaining popularity for industrial lighting is the cold cathode fluorescent tube, for which the Edison Swan Electric Co., Ltd., are displaying a recently introduced fitting. Employing either three or four standard 9 ft. 6 in. tubes, these reflectors are 10 ft. long overall. For use in particularly severe conditions, they can be supplied in a vitreous enamel finish, whilst for mounting a special adjustable bracket is available.

Fittings for blended light sources, developed for use in power stations, aircraft hangars, or similar buildings which high mounting is necessary, are featured by Falk, Stadelmann and Co., Ltd. Designed for use with tungsten filament and mercury vapour discharge lamps, two sizes are available, to provide high intensity illumination having a reasonable colour rendering.

### *Illuminated Ceiling*

A development in store lighting, being shown for the first time in this country by Philips Electrical Ltd. Known as the "Rotterdam Ceiling," it comprises an aluminium faced grid of squares of approximately 2 ft sides hung below the ceiling which is itself painted matt black. Having selected a suitable location for the fitting, louvres are dropped into two appropriate adjacent squares and a trough fitting for 4 ft flourescent lamps placed above them. Should it be necessary to move from this position, the fitting is slid to its new location and the louvres transferred.

Fittings utilising recently introduced circular fluorescent lamps are an attractive and new addition to the range of fittings displayed by Siemens Electric Lamps and Supplies, Ltd. Standard 40 W circles are used in the fittings which can be employed equally well in domestic or commercial application. Built in the inverted mushroom style, the fittings have Perspex diffusers and are fixed to the ceiling with a short pendant attachment.

No description of lighting fittings would be complete without reference to Coronation lighting exhibits. Under this heading is a fitting displayed by Benjamin Electric Ltd. which should provide a source of delight to children. Being shown for the first time, their Nursery 'Coolicon' shade, constructed of translucent material on which are printed gay, colourful emblems and pictures. It is designed for a 60 W lamp and has a glazed finish to facilitate washing.

Exterior illumination has its representation in street lighting fittings among which the Revo Electric Co., Ltd., are exhibiting among others, their "Silverblue" model. Designed for 240/400 W mercury vapour discharge lamps, this tubular fitting comprises a cast aluminium canopy and frame, provision being made by either top or side entry. In conjunction with a stainless steel reflector system, light control is effected with side panels of prismatic glass aimed at ensuring a high utilisation of the total available light.

Requirements for stage lighting impose problems on the stage lighting engineer, particularly where control of the light output of fluorescent lamps becomes necessary. The Strand Electric and Engineering Co., Ltd., are introducing a new "Thyralux" dimmer on their stand designed for this purpose.

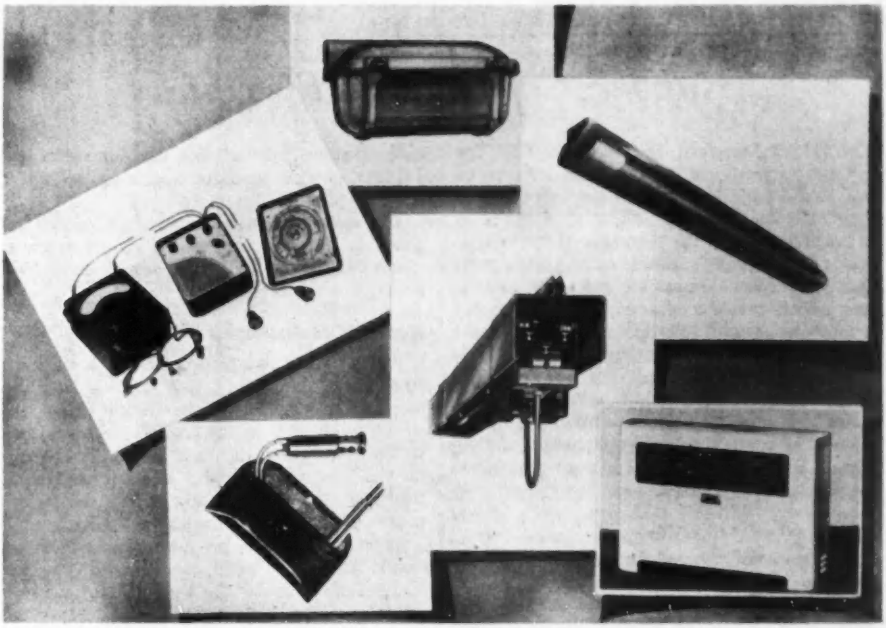
Thorn Electrical Industries, Ltd., are featuring equipment for testing glow switch starters for fluorescent lamps. Each switch is subjected to hundreds of starts, after which its operation is tested, results of which are stored in a memory circuit which passes or rejects the starter after completion of the test.

### *Relays and Control Equipment*

Modern relays take many forms ranging from high-speed models for protection gear to the modest telephone type relay without which communication equipment would be valueless. Control equipment using such components has an even greater variety, of which one example shown by Londex Ltd. is a new version of their floatless level control, "Lectralevel."

Automatic timing of switching operations, an essential feature in many forms of control apparatus, is the concern of Venner, Ltd., who are showing a number of their time-controlled switches. Prominent in their display are their time-switches, one of the more common applications of which is controlling street lighting.

Engel and Gibbs, Ltd., are showing their "Zebra" crossing flasher developed to meet the Ministry of Transport's demand for this equipment. The flasher combines a synchronous motor with a mercury switch of their own make, mounted in a single case. Aimed at facilitating installation and maintenance, a plug-in arrangement has been provided.



*(Top centre) Revo's attractive "Silver-blue" street lighting fitting for mercury vapour lamps. (Top right) New Mazda fluorescent fitting. (Top left) The well known "Avo" meter, with the new p.f. and wattage measuring unit. (Centre) Single-phase "Uniduct" trolley feed rail, exhibited by Electro-Mechanical Supplies. (Bottom left) Martindale new voltage tester, complete with pouch. (Bottom right) "Thermovent" space heater of type being shown by E. K. Cole*

Relays for other applications are being displayed by the Donovan Electrical Company, among whose exhibits is featured a new range of power relays. Available in a range of types from 2 to 8 poles, they can be supplied rated at $7\frac{1}{2}$ amps at a pressure of 550 V.

Temperature control is yet another example of the variety of control equipment in general. The essential feature of such equipment is often the familiar bi-metal strip forming a thermostat, but in the "Simmerstat" shown by Sunvic Controls Ltd., temperature control is effected by energy regulators.

An important part of industrial control equipment, especially where process control is involved, are the motor drives operating valves and similar equipment. Motors for this purpose are to be found exhibited by Browning's Electric Co., who have a range of small low-speed geared models on show.

It is no great step from control to measurement, and indicating instruments. Making its debut in this field is the new power factor and wattage unit produced by the Automatic Coil Winder and Equipment Co. Ltd.

Much of value will be found in multi-range instruments displayed by Taylor Electrical Instruments Ltd. in which versatility is one particular quality. Providing current and voltage ranges in a.c. and d.c., and general purpose scales of resistance, their value for many jobs is not difficult to estimate.

Switchboard instruments similarly are liable to scant regard. An essential, but little appreciated feature, is scale clarity, especially if the instrument is to be used in poorly illuminated locations. Among these types being shown by Measuring Instruments (Pullin) Ltd., is to be noted their 6 in. regular pattern model, in which the scale is both clear and open.

Equipment in the parallel field of electronic engineering is being shown by Loma Electric Equipment, Ltd., in which they feature their "Metaltector" equipment for automatically detecting metal in non-metallic material.

We look forward to meeting readers at our own stand, No. 92, on which we are showing illuminated photographs of examples of typical wiring installations using the different techniques available today. Members of our technical staff will be in attendance throughout most of the exhibition to answer queries.

NOTES ON WIRING by Megohm

# *Rubber Cables and Flexibles*

BRITISH Standard Specification BS7 for rubber insulated cables and flexible cords is at the present time being revised, and I understand that one of the principal revisions is to be the reduction in the thickness of the insulation for 250 V grade cables and flexible cords. This has been made possible due to the experience gained over the past years and also to the progress made in rubber technology.

The question of specifying and measuring the thickness of the insulation has been the subject of discussion, but the cable manufacturers have expressed the view that the method defined in current documents should not be altered and it would appear that this viewpoint is being supported.

## *Reduced Diameters*

As a result of reduced thicknesses of insulation the overall diameters of sheathed cables may also in some instances be correspondingly reduced, and it may be possible, but to a lesser degree, to reduce the insulation of high voltage cables.

V.R.I. cables are at the present time manufactured in the following grades :—250 V, 660 V, 3,300 V, 6,600 V and 11,000 V, and it is of interest to know that there are 12 types of v.r.i. insulated cables, 2 types of flexible v.r.i. insulated cables and 7 types of v.r.i. flexible cords. The range of v.r.i. cables include taped, braided and compound cables, lead and lead alloy sheathed cables, tough rubber sheathed cables, p.v.c. sheathed cables, armoured cables and aluminium or hard metal sheathed cables. The range of flexible cables and cords include taped, braided and compound cables, tough rubber sheathed cables, unkinkable flexible cords and parallel twin flexible cords. Parallel twin flexible cords, however, are in general not approved for installation work by the I.E.E.

In the revised edition of BS7 I also understand that it will be made clear that 250 V grade cables and 250 V house service overhead cable systems are suitable for connection to 3-phase, 4-wire systems operating at 440 V between phases.

The colours for cables and flexible cords are given in Table 1; in flexible cables green is also used instead of black for the earth continuity conductor.

TABLE 1—DISTINGUISHING COLOURS FOR CABLES

| | |
|---|---|
| Single cables ... ... | Red or black. |
| Twin cables ... ... | Red and black. |
| 3-core cables ... ... | Red, white and blue. |
| 4-core cables ... ... | Red, white, blue and black. |
| Twin cords ... ... | Red and black. |
| 3-core cords ... ... | Red, black and (green for the earth continuity conductor). |
| 4-core cords ... ... | Red, white, blue and (green for the earth continuity conductor). |

## *Earth Conductors*

In lead alloy sheathed cables with an earth continuity conductor, this should be laid longitudinally under the sheath and be so constructed that it is in continuous electrical contact with the metal sheath of the cable throughout its length and cannot be dislodged from this position when the cable is bent during the course of handling or installation work.

In tough rubber or p.v.c. sheathed cables the earth continuity conductor should be laid longitudinally under the sheath and occupy a centre position between the current carrying conductors. On cables fitted with hard metal sheathing the sheath should be sufficiently rigid so that the cable will not sag when supported in the horizontal plane with fixings at centres as set out in the I.E.E. tables and further, the sheath should be sufficiently flexible to enable the cable to be bent to a radius equal to six times its overall diameter without fracturing or damaging the sheath and insulation.

TABLE 2—TEST VOLTAGES FOR CABLES

| Rated Voltage | A.C. Test Voltage Applied for 15 minutes |
|---|---|
| 250 V | 500 V |
| 660 V | 1,000 V |
| 3,300 V | 6,000 V |
| 6,600 V | 12,000 V |
| 11,000 V | 20,000 V |

## *Voltage Tests*

Voltage tests to be applied to cables and flexible cables after installation are shown in Table 2. Alternatively these tests may be carried out with direct current but the testing voltage should then be increased by 1½ times the alternating current value.

With the recent up-rating of conductor values and the proposed reduction in insulation thickness, we surely now are making some progress in conserving valuable materials and one of the next steps must be to see that installation work is properly installed.

# *Should we*

# ABANDON DIRECT EARTHING?

***asks T. C. Gilbert, M.I.E.E.***

*In his paper "Domestic Electrical Installations—Some Safety Aspects," to which the author of this article makes extensive reference, Mr. H. W. Swann, H.M. Senior Electrical Inspector of Factories, notes that there are some conditions in which it is not safe to make the usual assumption that if anything goes wrong with the ordinary domestic installation, a fuse will blow. This fact, he suggests, may be of some importance because of the increasing utilisation of electricity per consumer and the wear and tear of ageing equipment.*

*Mr. Swann, in his review of this problem, devoted much attention to the possibility of using differential-current earth-leakage circuit-breakers for the protection of domestic installations, to enable leakage currents to be detected in the early stages. In this article Mr. Gilbert argues that the preferable solution is to change to an all-insulated system throughout domestic installations.*

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SOME few years ago the authorities concerned with the compilation of fire causation statistics alleged that the breakdown of insulation of electric wires and cables was responsible for some 4,000 fires a year. In his Institution paper, entitled "Domestic Electrical Installations—Some Safety Aspects," Mr. H. W. Swann, O.B.E., M.I.E.E., gave figures extracted from N.F.S. and Fire Brigade reports which showed that fires due to insulation failure in wires and cables amounted to 2,680 in 1949 and 2,250 in 1950; the latter figure appears to be about the average over a number of years. Mr. Swann broke these figures down to some extent, showing that some 294 were due to flexibles and 1,956 due to fixed wiring failures in 1950.

The tables quoted recorded only those fires which developed to an extent necessitating the attendance of a fire brigade, and there were many of a less serious nature which were dealt with by the occupier himself. There is no way of estimating the latter with any degree of accuracy, but even the established figures provide food for thought.

## *Increased Fires*

The Report of the Electrical Inspector of Factories for 1949 states that the number of electrically caused fires has advanced from 8% to 16% during the last 15 years. In the paper referred to above, it was stated that overloading of the conductors to an extent which makes them warm or hot in closed spaces does not inevitably set fire to the insulation, and recent research has shown that although both rubber and plastic insulation have failed under the heating effect of an overload on the conductor amounting to twelve times the rated current-carrying capacity, in neither case did ignition of the insulation occur, although the plastic is said to have shrivelled and the rubber melted. It is well known, of course, that insulation may be ignited at small current values, of the order of 4 amps, by breakage of the conductor under load, leading to internal arcing, but it is doubtful if flame could be persistent within a conduit, where all physical conditions are against it. Earth leakage probably precedes short-circuit, or may even induce it; many earth faults have to await this before isolation can be effected.

Into "failure of insulation of wires and cables" I think, we are entitled to read "failure of earthing or other methods of protection against leakage," as it is reasonable to suppose that had the fuse quietly blown under the fault, no fire would have occurred. We therefore have to seek the reasons why the fuse did not blow, and there would appear to be three—(1) difficulty in ensuring really effective continuity in the interior installation; (2) the introduction of cement-asbestos piping into main water networks, in large sections or repairs; (3) tampering with the fuses by the consumer himself.

## *Illusory Continuity*

Regarding (1); it is becoming clear that the apparently fortuitous good earth continuity provided by metal conduits is largely illusory, a view that is strongly reinforced by the publication of the E.R.A. Report Ref. V/T 109,

"The Incidence and Avoidance of High Resistance Joints in Steel Conduit Runs in Service." From this it may be deduced that in spite of careful lay-out, expert supervision and the employment of highly skilled labour, some 50% of all conduit runs may become suspect by reason of gradually increasing resistance, and about 10% will eventually become discontinuous by reason of corrosion or rusting.

### *Inadequate Checks*

It may be asked—"Why is all this blowing up now; for years we have checked the resistance of our conduit runs, both when newly erected and on periodical checks, and usually find that they are well within the regulation limit of one ohm; where have we gone wrong?" The answer is, of course, that we have never adequately checked the conduit runs, as the application of a few milliamperes to the earth continuity circuit in no way simulates fault conditions, and is merely playing with the problem. Moreover, the regulations are content to deal with the interior installation and, sometimes, the consumer's earth electrode, whereas only "loop" tests can check the whole of the earth fault path by bringing in every one of its component resistances.

### *Multi-current Measurements*

The point is well brought out in the E.R.A. report quoted, which states that no measurement of resistance at a single specified current can detect all joints that are likely to become unsound, and that it should be specified that continuity tests be made at a range of currents, any undue variation in the values of apparent resistance so measured to be held to denote non-compliance with the regulations. The report also recommends that the permissible limit to the resistance of an earth continuity conductor should be reduced to 0·1 ohm, in place of the present permissible limit of one ohm, for newly-installed conduit systems, except for runs known to exceed 100 feet in length. The reason for this rather drastic revision becomes clear when the matter of *impedance* of conduit runs is taken into consideration, for which most of us have pressed for a number of years. It is understood that in another hitherto unpublished E.R.A. Report (Ref. V/T 111) this matter has been gone into, and the general conclusion drawn is that if the overall *resistance* of the steel conduit and earthing lead does not exceed 0·2 ohm, then the *impedance* will probably be less than 1 ohm. This, however, will obviously again depend upon the magnitude of the testing current.

We might have hoped that the report would have been more specific as to the range of currents recommended for testing, with possibly some reference to voltage of application. In practice, not only are serious variations in apparent resistance noticeable with varying test currents—the resistance almost invariably rises much more steeply than the current—but the voltage also seems to have considerable bearing upon the recorded results—no explanation of this can be advanced, but it has been suggested that the juxtaposition of rusted and clean steel surfaces may offer a rectifier effect. The writer has knowledge of one new installation of excellent appearance and which under normal continuity tests as at present required seems eminently satisfactory; the application of 5 amps to the continuity path indicates a different picture, however, and with 15 amps, necessitating a voltage step-up to 60 V, the installation is due for immediate condemnation as unsound.

### *Consumer's Earth*

Important as these various findings and recommendations are, however, and representing considerable advance in the proper appreciation of the problem, we are still only tinkering with it, by undue concentration upon one section of the earth fault path immediately available for test. We *must* bring in the consumer's electrode, the sub-station electrode, and all the ground in between—not forgetting the supply line. If normal loop testing be applied, however, it is usually at low current, leaving us still in the dark. What we need most urgently to know is, if the fault path is capable of carrying the prospective fault current without, on the one hand, bursting into blue flames or, on the other, setting up dangerous leakage potentials all along the path and, worse still, on to the casings of all healthy equipment connected to it. Most small houses are today served through main fuses rated at 60 amps, necessitating the passage of some 100 amps to cause them to melt within a reasonably short time; should we test at 100 amps? If we are afraid, should we use the method?

### *Continued Current*

Under normal loop testing, injecting about 8 amps, the above installation might show that the total resistance (not the impedance) did not exceed the requisite limit of 2½ ohms, but it seems clear that the use of a heavier current would give less favourable figures. Assuming

that the impedance were three actual ohms, isolation could not be relied upon, but a persistent fault current of some 80 amps might flow indefinitely. If there were only one conduit joint with a resistance of no more than one ohm in the interior installation this immediately becomes a hot-spot dissipating some 6 kW, and it is not difficult to visualise how fires may occur. In his paper, previously referred to, Mr. Swann says: "It may be that fire risk lies more in the effect of leakage or fault current in the earth continuity path than in short-circuit or breakage of the rubber insulation; leakage may transfer to gas pipes and inspection has disclosed many cases of contact or close proximity." It is thought that we might accept the view of this eminent engineer, probably more experienced than most of us with the seamy side of electricity utilisation; the difficulty is enhanced with the increasing use of h.r.c. fuses, with which heavy currents just short of fusing current may flow for long periods without the fuse element deteriorating and melting.

### *Water Pipe Dangers*

Much more could be written on this point, but proceeding to (2), the use of cement-asbestos main-water piping, the dangers set up in any locality where this occurs have been very clearly discussed in another E.R.A. Report, Ref. V/T 101—"The Electrical Resistance of Water Mains, with Special Reference to Cement-Asbestos Piping," dealing with troubles experienced in Manchester and Rochdale. In my view, this Report does not emphasise sufficiently strongly one of the major dangers where direct earthing to water pipes has been utilised for protection and where this facility has been suddenly withdrawn, and this is the case of the household where gas water heaters are used. In one case at Rochdale the resistances recorded were as follows: service water pipe, 6·3 ohms; cable sheath, 0·9 ohm; gas service, 0·78 ohm; in any house with a gas water heater or geyser, with the gas and water services metallically connected, the gas service must become the most effective part of the earthing system and thus carry the major portion of any earth fault current, with all that this implies. It should be pointed out that the tests in the affected areas were apparently carried out with light-current equipment; had heavy-current checks been made, with emphasis upon impedance instead of resistance, it is thought that a very different picture would have emerged. It might have been more devastating, but would have provided a more useful guide for future practice.

### *Deterioration with Time*

That the problem will increase with time rather than the reverse is clear from two main reasons—one, the increasing average age of installations, and, another, the heavier loading of domestic and industrial installations. It does not seem to be realised that every time the main overload protective gear is set up to some higher value then a few ohms must of necessity be lopped off the earth fault path impedance if isolation under fault is to be ensured and the dangerous persistent leakage eliminated. It is assumed that forthcoming editions of our regulations must take some note of the recommendations of the E.R.A. reports quoted on the subject of more adequate testing; if they are not adopted to what end and for what purpose are these disturbing investigations undertaken?

### *Reinforcement of Insulation*

High-cost protective equipment may be suitable for the industrial installation but is hardly likely to be adopted for the domestic installation—except under compulsion—and in my view the ultimate solution of the leakage protective problem will lie along the lines indicated in the 12th Edition—the obvious reinforcement of insulation; efforts should not be directed alone towards the isolation of leakages after they have occurred, but rather to their prevention. It will be remembered that even completely metal-clad equipment is to be exempted from general earthing requirements provided it has "double insulation," satisfying a British Standard, of which, so far, only one has appeared. The availability of vastly improved insulation materials, synthetic and plastic, should make reinforced insulation a much simpler matter than in the past, and it is no longer necessary to press for all-insulated enclosures for domestic or industrial equipment—although these should be encouraged where possible and compatible with mechanical strength. It will not be sufficient to deal only with appliances and equipment, however, we must also redesign the circuit wiring with reinforced insulation—a comparatively simple matter once we can get rid of our steel conduit complex.

It is hoped that the above will not be read as just another scare article, or the buzzing of bees in particular bonnets; the attempt has been made to make it as objective and realistic as possible, with the main reliance upon the opinions and findings of others rather than those of the writer—and of engineers of greater authority.

# *Hydro Progress in Scotland*

## H.E. BOARD REPORT FOR 1952 SHOWS MORE CONSUMERS, LOWER SURPLUS

GENERATION of 889m units from water power and the increase of installed capacity of hydro generators from 267·5 to 391·2 MW were the leading features of 1952 for the North of Scotland Hydro-Electric Board, as stated in the recently published Annual Report for that year. In 1949, 322m units were generated with 87 MW of plant, this output being almost entirely attributable to the Grampian Company's pre-war Rannoch and Tummel Schemes. The increase represents the achievement of post-war years.

TABLE 1—HYDRO-ELECTRIC SCHEMES

| | Capacity MW | Output million units/year |
|---|---|---|
| Already in operation ... | 391 | 889 |
| Under construction ... | 287 | 828 |
| In course of promotion or survey ... ... | 416 | 1,477 |
| Total ... ... | 1,094 | 3,194 |

Including steam and diesel stations, the total installed capacity at the end of the year was 560 MW, and the aggregate energy generated, 1,237m units. These totals represent increases of 3·9% and 14·4%. The disproportionate increase in output was due not to higher rainfall but to the fuller operation of several of the hydro-electric schemes.

### *Generation and Distribution*

Average cost per unit generated during the year was 0·576d, but this figure has little significance because of a wide disparity between costs for the various methods used. For hydro-electric power, the cost was 0·42d/unit; this remains low because of schemes built in less costly pre-war days. Steam generation, affected by the January 1952 coal price increase, cost 0·81d/unit, while for diesel generation the price was up to 1·95d/unit.

Considerable preliminary work was carried out for the transmission lines of the Highland Grid, which will operate at 132 kV, and a line from Tummel Bridge to Loch Sloy was brought into operation. Work was also continued with distribution schemes, and during the year 19,897 new consumers were connected at an average cost, in terms of capital expenditure on distribution, of £165. Progress was also made with conversion from d.c. to a.c. supplies, and with 10,274 consumers dealt with during the year, there were only about 5,000 remaining on d.c. at the end of December, most of them in Perth and Dundee. A change to the standard 240 V a.c. supply is also in progress.

During 1952, the average charge to consumers was 1·498d/unit. In the autumn, the Board increased charges by nearly 10% to meet increases in operating costs and in the rate of interest payable on loans for capital expenditure. Unit sales totalled 1,051m units, 304m units going to the B.E.A. while 20m units was used in the construction of hydro-electric schemes.

Special attention was given during the year to the farm load, and 1,144 farms and 2,048 crofts received a supply for the first time. Experiments with, and the advocacy of, hay drying by electricity continued, several farmers who were concerned in the trials testifying to its advantages.

TABLE 2—NET REVENUE ACCOUNT

| Item | 1952 £ | 1951 £ |
|---|---|---|
| Generation and purchase of electricity ... ... ... | 2,979,590 | 2,442,841 |
| Transmission ... ... | 438,253 | 293,551 |
| Distribution ... ... ... | 1,781,075 | 1,341,791 |
| Rates, etc. ... ... ... | 234,760 | 200,062 |
| Managerial and general expenses ... ... ... | 609,931 | 628,346 |
| Staff housing ... ... | 37,372 | 25,448 |
| Staff college ... ... ... | 9,519 | 18,804 |
| **Total expenditure** ... ... | **6,090,500** | **4,950,843** |
| *Less* Surplus on sales and service ... ... ... | 28,569 | 41,155 |
| **Net expenditure** ... ... | **6,061,931** | **4,909,688** |
| Sales of electricity to B.E.A. | 1,404,694 | 922,724 |
| Sales of electricity to other consumers... ... ... | 4,662,166 | 4,003,484 |
| **Total income**... ... ... | **6,066,860** | **4,926,208** |
| **Net surplus** ... ... ... | **4,929** | **16,520** |

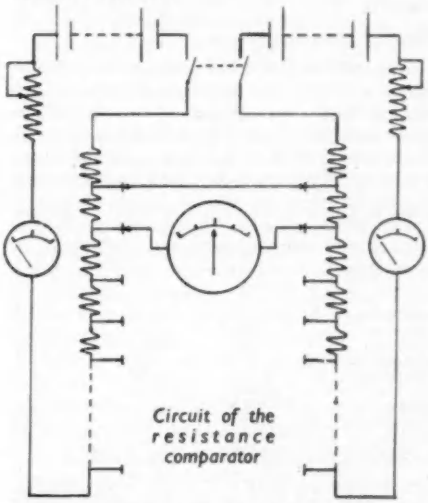
In the report of the Electricity Consultative Council for the North of Scotland District, which is appended to the main report, there are comments on "freedom of choice" for tenants in local authority houses, and on service charges. In the former matter, they replied to criticisms from the Scottish Gas Consultative Council by endorsing the present arrangements, under which local authorities obtain lower service charges if electric cooking is adopted.

Similarly, the Council stigmatised as "ill considered and unfair" allegations that service charges made to individual consumers constitute "financial pressure" interfering with true freedom of choice.

# PROBLEMS AND PRACTICE in Engineering

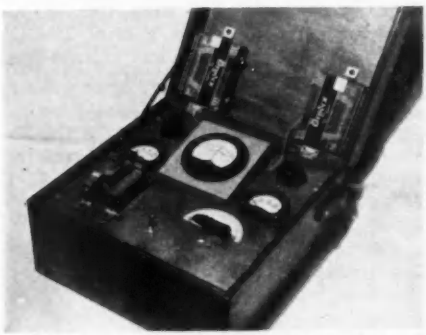
## *Resistance Test Set*

THE writer was confronted with the problem of having to test large numbers of resistance bobbins, each of which was in 21 sections of different ohmic values. A special instrument was designed which proved to be a valuable time saver.



*Circuit of the resistance comparator*

The instrument is essentially a resistance comparator, there being built into the instrument a set of 21 resistances of 100 per cent. ohmic values, to which the bobbin being tested is made to compare by passing a similar current through the instrument resistances and the bobbin being tested.



*The resistance test set complete in its case*

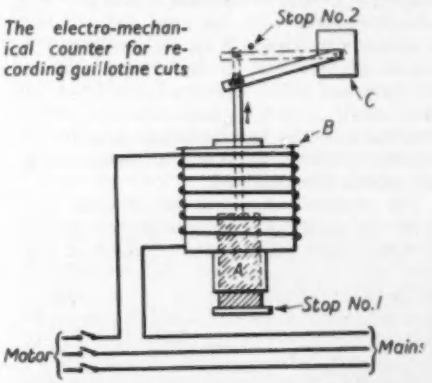
The difference in voltage drop between any two sections is made to indicate on a centre-zero meter by means of a 21-position switch which cross-connects each section in turn. The voltage drop of each section being a direct function of ohmic value, the meter deflection was made to indicate the plus or minus percentage ohmic discrepancy.—*C. Bright.*

## *Counting Cuts*

SOME time ago I devised a recorder which may interest readers of this page. The requirements were for a counter to record every cut made by a guillotine which was driven by a 5 h.p. single-phase motor. When the machine was running free the current taken by the motor was 6·5 amps. On the point of cutting it flashed to around 15 amps.

With reference to the sketch, the normal current was insufficient to move the ferrous

*The electro-mechanical counter for recording guillotine cuts*




metal plunger A. When the load flashed to the cutting value (15 amps) the plunger A was attracted to the centre of coil B which, as will be seen, was in series with one phase. This in turn moved the arm which is connected to a ratchet counter C and moved it one digit. The plunger was then returned by gravity.

This operated satisfactorily at a rate of 20 cuts per minute or much faster if required, and to date has recorded 500,000 cuts with no attention.—*A. Douglas.*

*Contributions to this page dealing with specific items of interest to electrical engineers and maintenance men are welcome, and, if accepted, will be paid for at our standard rates. Problems of a practical nature to which a solution is required will also be considered. Contributions should be written on one side of the paper only and may be accompanied by sketches, which will be re-drawn for publication.*

# GENERATION IN WESTERN EUROPE

## *An Estimate of Electrical Expansion in O.E.E.C. Countries*

PROSPECTS for the balance of supply and demand on the electricity systems of O.E.E.C. countries* are given in two new publications which the Organisation has released. In the first of these, "Position of the Electricity Industries in O.E.E.C. Countries," it is suggested that having regard to the increasing co-ordinated efforts being made to secure European economic expansion, and assuming a reasonable degree of economic stability, an average increase in electricity requirements of 7% per year may be taken as basic for the period 1952-56. This is somewhat lower than the corresponding figure for the period 1947-52.

Table 1 shows the out-of-balance forecast for output and requirements, and indicates that a growing deficit may be expected. Although growth of demand is not alarming when compared with the total output, there is special significance in its composition: it is almost entirely due to the requirements of Germany and Italy. Another factor which has to be kept in mind is the dependence on rainfall conditions of the hydro-electric plants. Any variation from average precipitation can change the balance considerably.

For countries adjoining one another, there is the possibility of organising power transfers to help avoid a net deficit. Conditions in 1956 from this aspect are predicted in Table 2. At present exports are only about 4·3% of total generation in the interconnected countries, and it is not expected that this proportion will change much during the period under review.

In the estimates for the future which were given in the report, consumption in the United Kingdom is shown as rising to 72,207m kWh by 1956, but this figure is in the nature of a tentative estimate by the O.E.E.C. Secretariat, not based directly on information from this country.

### *Coal Consumption*

The second document, which is complementary to the first, summarises information on the fuel consumption of public utility power stations which was collected during the first six months of 1952. Once again, forecasting up to 1956 is attempted, and it is concluded that the requirements of O.E.E.C. countries for good quality power station coal will rise from the 53·5m tons required in 1950 to 70·7m tons in 1956. This corresponds to a yearly rate of increase of 5%, to cover a period during which the electrical energy generated in thermal stations is expected to rise at 7·5% per year. The thermal efficiency in power stations which use mainly high-grade coal (as distinct from lignite, etc.) should rise from the 20·7% recorded in 1950 to a 1956 level of 23·4%. Figures for the United Kingdom in these two years are shown as 21·5% and 24·5%.

TABLE 2—CAPACITY OF INTER-CONNECTED COUNTRIES ESTIMATED FOR THE YEAR 1956

| Country | Max. capacity at peak MW | Demand at peak MW | Surplus MW |
|---|---|---|---|
| Germany ... | 13,100 | 15,100 | −2,000 |
| Austria ... | 2,070 | 2,060 | 10 |
| Belgium ... | 2,926 | 2,272 | 654 |
| Luxembourg | 169 | 147 | 22 |
| Netherlands | 2,725 | 2,670 | 55 |
| France ... | 10,200 | 10,100 | 100 |
| Italy... ... | 10,083 | 11,670 | −1,587 |
| Switzerland... | 2,950 | 2,120 | 830 |
| Total ... | 44,223 | 46,139 | — |

TABLE 1—TRENDS OF REQUIREMENTS AND CAPACITY FOR ALL O.E.E.C. COUNTRIES COMBINED

| | Energy—$10^9$kWh | | | | Installed capacity—$10^3$ MW | | |
|---|---|---|---|---|---|---|---|
| | Probable output | | Probable requirements | Deficit | Thermal | Hydro | Total |
| | Total | Hydro | | | | | |
| Reference year, 1951 | | | | | | | |
| 1951 ... ... ... | 254·2 | 113·3 | — | — | 38·3 | 27·2 | 65·5 |
| 1952 ... ... ... | 270·6 | 118·2 | 271·7 | 1·1 | 41·7 | 30·0 | 71·7 |
| 1953 ... ... ... | 288·7 | 127·6 | 289·5 | 0·8 | 45·4 | 32·1 | 77·5 |
| 1954 ... ... ... | 308·7 | 136·9 | 311·2 | 2·5 | 48·8 | 34·7 | 83·5 |
| 1955 ... ... ... | 327·1 | 145·2 | 331·3 | 4·2 | 51·3 | 36·5 | 87·8 |
| 1956 ... ... ... | 344·6 | 150·5 | 350·7 | 6·1 | 54·1 | 38·1 | 92·2 |
| Yearly rate of increase % | 6 | | 7 | | 7·1 | 7 | 7·1 |

* *Member countries of the organisation for European Economic Co-operation are: Austria, Belgium, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Sweden, Switzerland, Trieste, Turkey and the U.K.*

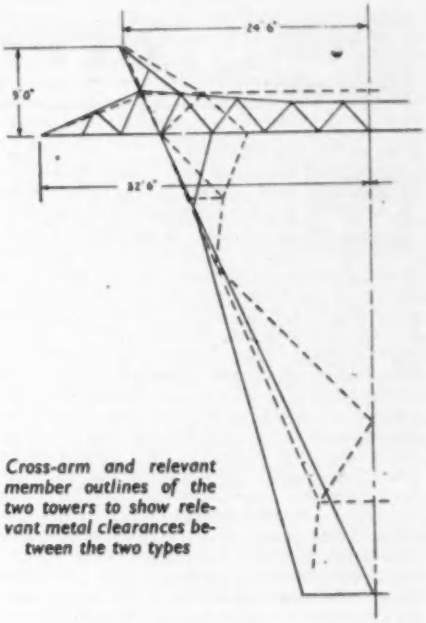
# An Italian Engineer proves C.I.G.R.E. claim

WHEN, in C.I.G.R.E. in 1948, Mr. A. E. Percivall presented a paper on the "Mechanical Design of 264 kV (now 275 kV) Transmission Lines in Great Britain," Mr. Bianchi di Castelbianco, in an informal discussion, suggested that he could design a tower for the same conductor spacings and weights but at a much reduced tower weight. Some scepticism was expressed, and Mr. Bianchi accepted the implied challenge, with the result that a tower to his design was built and tested at the Societa Anonima Elettrificazione testing station at Milan in the presence of several British representatives. The tower was tested to the same figures as had already been carried out on the B.E.A. tower in England, and stood up successfully, despite the fact that its weight was 4·8 tons as compared with the British design of 7·8 tons.

Some reasons for the differences in weight have now been given in E.R.A. Report O/T9 (price 10s. 6d.) by P. J. Ryle. The main saving appeared to be due to the extensive use in the Italian design of thin-walled tubes, instead of angles, for the bracing members. Further, the British tower was completely galvanised and had to be assembled with bolted members, while the S.A.E. tower was not designed to be galvanised, and quite extensive frames were made up as complete units with welded joints.

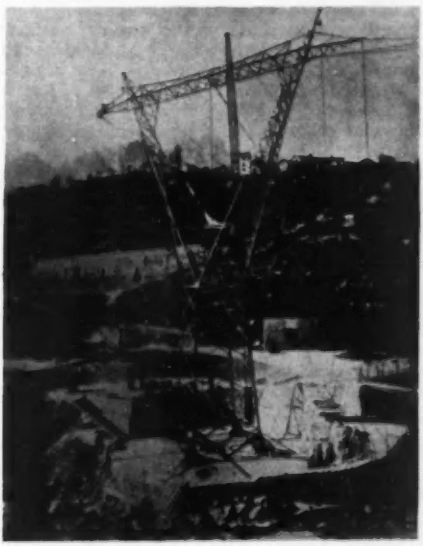
In this country, however, the cost of seamless tubes per ton is about twice that of angles, and it is doubtful if the saving in weight introduced by their use would make much lowering in cost. The galvanising of tubular members, to line up with British practice, also presents difficulties, and Mr. Bianchi stated that had he to design a tower to be galvanised throughout and with no welding, he would probably revert to angles, when the tower weight would rise to about 5·9 tons.

Other comments were that in Great Britain the use of tubular members with walls as thin as 0·1 in. would be risky as bad painting would lead to serious corrosion, and that bolts of $\frac{1}{2}$ in. dia., while theoretically satisfactory, could be overstressed by heavy-handed erectors—a reason why British tower specifications called for a minimum bolt diameter of $\frac{5}{8}$ in.




*Cross-arm and relevant member outlines of the two towers to show relevant metal clearances between the two types*

*The completed S.A.E. design under test at Milan. The lighter construction can be seen in the illustration below*



# overseas news

### Fire at Hydro Station

Engineers and repair crews have been praised on their work in restoring to operation the Chats River power plant of the Hydro-Electric Power Commission of Ontario, which was severely damaged by fire earlier this month. Six of the eight sets are now running. According to officials of the Commission the fire started following the maloperation of an oil circuit-breaker at the Ontario end of the plant. The oil tank of the c.b. exploded, involving the plant's lubrication oil system, it seems. Spattering burning oil quickly spread the flames throughout the three-storey dam building and sections of the walls and roof collapsed. Fortunately, plant employees quickly switched out the remaining turbo-generators and closed the gates preventing the ingress of water. Apparently only gasoline-driven water pumps were at hand. Chats Falls hydro-electric power development was the first major inter-provincial installation on the Ottawa River. It houses eight turbines with a total capacity of 220 MW. Construction of the project began in 1929. Apart from the circuit-breaker, two of the sets were seriously damaged and a frequency changer, and a crane at the Ontario end of the building were destroyed. Unofficial estimates of the damage have been put at $5 million.

### Talks on Seaway

Seriously interested in the St. Lawrence Seaway and Power project, three British representatives of the Export group of constructional engineers, are due to leave tomorrow, March 20, for Canada to consult with officials in Toronto. These businessmen are Brig. A. G. Bonn, a director of Richard Costain, Mr. F. Taylor, chairman and managing director of Taylor Woodrow and Co. and Mr. A. E. Parkinson, chairman of Sir Lindsay Parkinson and Co. They expect to be away for two or three weeks.

### Newfoundland Development

The development of the latent mineral water-power and timber resources of Newfoundland and Labrador are the main objects of a syndicate set up with the title of British Newfoundland Corporation Ltd., with which the Newfoundland Government last week concluded an agreement. As we have already noted the English Electric Co. Ltd. is one of the 19 companies at present forming the syndicate.

### B.C. Borrowing Powers

Legislation is shortly to be introduced by the Provincial Government to increase the borrowing powers of the British Columbia Power Commission by a further $20 million. This will raise the Commission's borrowing powers to $80 million. It is understood that all but four or five million dollars of the original $60 million borrowing power has been spent. Additional funds will be used for extension in rural areas. It is indicated that the development of the North Fork of the Quesnel River at Cariboo Falls will be one of the projects to be undertaken. This was previously authorised by the British Columbia Government for the South Fork, but met strong objections from the fishing industry. Development of the North Fork was then considered.

### Site Selection by Air Survey

A further example of the value of aerial survey in ascertaining sites for hydro-electric schemes and transmission line routes across wild country is shown in the news that the consulting engineers of the Quebec Hydro Electric Commission, Mr. H. G. Acres and Co., of Niagara Falls, Ontario, adopted the method in connection with the Bersimis project. The target date for the first units of this 1,000,000 h.p. development was advanced from 1960 to 1956, and the consultants had quickly to obtain information to fix the dam and power station sites, etc. This involved topographic mapping of 275 sq. miles by the Canadian associate of Hunting Aviation Group. Subsequently similar methods were used to locate transmission line routes between the dam site and the Manicouagan power plant at Baie Comeau, 100 miles distant on the north shore of the St. Lawrence River.

### Atomic Electricity

A reactor, or atomic furnace, capable of producing useful amounts of electric power has been developed at the U.S.A. Oak Ridge National Laboratory. The Atomic Energy Commission, in announcing the development, described it as an important milestone in the search for economical atom-generated power. In tests last month the reactor produced 150 kW, it is stated. This power-producing furnace is a new type of reactor known as a "homogeneous reactor" into which a solution of uranium is fed. The heat created is used to produce steam and so drive the generator. A test reactor in Idaho produced a small amount of electric power two years ago, but this latest development, the Atomic Commission claim, is "the first to operate at a temperature and power high enough for production of steam to run a standard industrial turbine-generator." Further study of the reactors will be made to acquire information regarding the feasibility of the homogeneous reactor for full-scale power production. The cost of the reactor is estimated at

slightly more than $1 million to build, while an additional $3 million has been spent on research and development.

### Malta's Station

Malta's new power station will in all probability be in commission before the end of the year, according to Mr. S. L. Burgess, resident engineer for Preece, Cardew and Rider, the consulting engineers to the Government of Malta. Erection of the actual plant is expected to be completed by June. The station is being constructed in vaults under Jesuits Hill, Marsa. The power plant has been financed under Marshall Aid through the O.E.E.C. and E.C.A. and has been supplied by Westinghouse, of America.

### Uganda Line Plan Dropped

The plan of the Uganda Electricity Board to erect a 240-mile long 132 kV power line from Owen Falls to the Kilembe Copper development, is being abandoned, we learn. The line was to have been built to permit the smelting of concentrates at Kilembe, the mining concern advancing 75% of the cost. But now that Company has decided to transport the ores on a new railway line to Jinja. Output from Kilembe is expected to be over 500 tons of concentrates daily, and the decision to change the venue of the smelting process is obviously a blow to the Uganda Electricity Board which had considered the project of great importance. The Board is to discuss the matter at a meeting on Monday.

### Production Plan

Detailed programmes of planned industrial development in India, both in the public and private sectors, under the Five-Year Plan, have now been published by the Planning Commission in the form of a separate volume. The programmes cover 42 principal industries, including electrical engineering, and the accompanying table lists the production targets for various items as compared with 1950-1 production. In the public sector the Central Government

| Goods | Production 1950-51 | 1955-56 |
|---|---|---|
| Dry batteries ... ... | 136·5 million | 320 million |
| Storage batteries ... | 200,000 | 400,000 |
| A.C.S.R. cables ... | 1,674 tons | 5,000 tons |
| Electric fans ... ... | 194,000 | 320,000 to 350,000 |
| Electric lamps: | | |
| (i) G.S.L. lamps ... | 15 million | 30 million |
| (ii) Miniature lamps | N.A. | 16 million |
| Electric motors ... | 99,700 h.p. | 320,000 h.p. |
| Transformers ... | 179,000 kVA | 450,000 kVA |
| Radio receivers ... | 49,000 | 350,000 |

projects include two electrical factories. These are Hindustan Cables Ltd., in which Rs.12·97 million are being invested, and Indian Telephone Industries, for which Rs.13 million are allocated. In the latter instance assembly has already started, but the cable concern is scheduled for completion either this year or next, and annual production is estimated at Rs.10 million worth.

### Where are the Boards ?

The question is now being raised in New Delh whether the target date of March 31, 1953, fixed for the formation of all the State Electricity Boards will be again extended. In recent weeks there has been some criticism of the State Governments, particularly the Bombay Government which originally sponsored the Electricity (Supply) Bill, at their tardiness in implementing the basic provision of the 1948 Electricity (Supply) Act. This legislation provided that a Board should be set up in each State to administer the existing Government-sponsored electricity schemes and prepare new development projects. They are to be autonomous bodies staffed by experts exercising control over the financial policies of licensee undertakings and to regulate their tariffs. Originally March 31, 1950, was stipulated as the date by which the Boards should be set up. Since then the date has been altered twice. So far only Madhya Pradesh and Delhi have complied with the Act. It is now suggested that the failure of most of the Governments to form these Boards shows a woeful lack of a sense of urgency on their part in the matter of power development.

### Restrictions in Queensland

In recommending power restrictions for the coming winter in Brisbane and South-east Queensland, the electricity supply authorities are hoping to avoid a 7 a.m. start for workers. Representatives of the State Electricity Commission, Southern Electric Authority, Brisbane City Council and the Toowoomba Electric Light and Power Co. had conferred on the matter and have recommended the following prohibitions lasting from April 7 to August 15. Electricity used for space heating, including radiators, from 8 a.m. to 10 a.m. and 5 p.m. to 6.30 p.m.; water heaters in residential premises from 5 p.m. to 6.30 p.m.; outdoor lighting of sports and recreation grounds from 5 p.m. to 6.30 p.m.; and advertising signs and/or demonstration lighting, 8 a.m. to 10 a.m. and 5 p.m. to 6.30 p.m. It also is recommended that during April only, shop window and display lighting should be restricted between 8 a.m. to 10 a.m. and 5 p.m. to 6.30 p.m., while industrial consumers should effect a 10% voluntary reduction in load from 8 a.m. to 10 a.m.

### A Heating Idea

A new idea by a New Zealand firm of builders for a cheap and permanent form of house construction embodies electric radiant floor heating. The walls and floor are built of soil and cement in the proportions of ten parts of clay, two of metal chips and one of cement, which are rammed together to form a hard block. In the floor is laid a small diameter copper-sheathed cable, presumably with mineral insulation, this installation being controlled by a thermostat. It is claimed that these houses will outlast the normal wooden type.

D

# *PERSONALITIES*

## IN THE INDUSTRY

Chosen for the post of power station superintendent at the new 240 MW Chadderton h.p. generating station, North Western Division, B.E.A., is **Mr. Frank Dewhurst,** A.M.I.E.E., A.M.I.Mech.E., at present deputy station superintendent at Stuart Street power station in the same Division. Mr. Dewhurst is an old Lancashire Electric Power Co. man, having commenced his career at Padiham power station in December 1926, when that station commenced operating. In its first seven years of operation that station achieved the highest thermal efficiency in its class, with a figure usually over 21%—which was considered exceptionally good at the time. Leaving Padiham, he went to Kearsley power station in 1945 where he served in various capacities, ultimately as boiler house superintendent, prior to being promoted to deputy station superintendent at Stuart Street in January, 1952.

*Mr. F. Dewhurst*

The Brighton Education Committee has appointed **Mr. P. E. Bird,** B.Sc.(Eng.), as lecturer in electrical engineering at the Technical College from May 1 next.

J. H. Tucker and Co., Ltd., have appointed **Mr. Walter S. Mercer,** 20 Bedford Street, Belfast, as their agent for Northern Ireland in succession to **Mr. A. M. Wedderburn.**

The following new appointments have been made in the "Servis" electric washing machine sales organisation of Wilkins and Mitchell, Ltd.: **Mr. E. S. Holland,** Scottish divisional sales manager, becomes sales promotion manager; **Mr. J. F. Millar,** sales representative for Ayrshire and Dumfriesshire, becomes Scottish divisional sales manager, Glasgow; **Mr. F. McL. Bruck,** Southern divisional sales manager, Wolverhampton, becomes Northern divisional sales manager, Bradford; and **Mr. J. E. Gutteridge,** sales representative, West Country, becomes Southern divisional sales manager, Wolverhampton.

We hear that **Mr. W. L. Henderson,** A.M.I.E.E., has resigned his position as assistant secretary to the Engineers' Guild Ltd., as from April 1, which post he has held since 1948, in order to take up a position in Industry. The General Council of the Guild have appointed **Mr. J. G. Orr,** M.A. (cantab.) to succeed Mr. Henderson. Mr. Orr is a barrister-at-law, and until recently held a responsible position with the British Motor Trade Association.

Formerly works manager for B.S.A. Tools Ltd., **Mr. F. H. Harris,** B.Sc., M.Inst.P.E., has been appointed as group production adviser to Associated British Engineering Ltd. Mr. Harris began his engineering experience with an apprenticeship with the British Thomson-Houston Co. Ltd., and subsequently served them as an industrial engineer before becoming production controller at Alfred Herbert Ltd., an appointment he held for seven years.

At the recent Annual Dinner in Edinburgh of Scottish Centre, I.E.E., **Mr. H. V. Henniker,** M.I.E.E., was presented with a wristlet watch and Mrs. Henniker with a lamp standard in appreciation of Mr. Henniker's services as Hon. Assistant Secretary to the Scottish Centre over a period of 26 years. The presentations were made by **Col. B. H. Leeson,** President, I.E.E.

The Radio Industry Council is to present to **Sir Noel Ashbridge,** who retired from the B.B.C. last year, a portrait of himself by Mr. Frank O. Salisbury. The portrait is nearly finished and it will be presented at a date to be announced later.

**Mr. G. D. East** has been appointed deputy power station superintendent, at Castle Meads generating station, South Western Division, B.E.A., with effect from April 1. Prior to this appointment Mr. East was a shift charge engineer at Ironbridge generating station, Midlands Division.

**Mr. A. A. Fulton,** B.Sc., M.Inst.I.E., M.I.Mech.E., chief hydraulic and civil engineer to the North of Scotland Hydro-Electric Board, has been elected a Fellow of the Royal Society of Edinburgh.

The board of Peto Scott Electrical Instruments, Ltd. announce that **Mr. J. Foster Veevers,** M.I.E.E., M.I.P.E., M.I.I.A., will shortly be joining the company in the capacity of managing director. **Mr. C. G. Rieck** has retired from the board. Mr. Veevers joined the Plessey Co. last August as general manager of their Swindon works. He was previously with the General Electric Co. Ltd. as manager of the Stockport works of Salford Electrical Instruments, Ltd.

*Mr. J. Foster Veevers*

The Micanite and Insulators Co. Ltd., announce that **Mr. D. J. Greene,** works manager, has been elected to a seat on the board of directors.

For the position of deputy station superintendent at Bankside power station, London Division, B.E.A., **Mr. P. Holt**, A.M.I.E.E., A.M.Inst.F., has been chosen. Since the beginning of 1952, Mr. Holt has held a similar position at Plymouth "B," South Western Division. Earlier he had been shift charge engineer at Battersea power station since 1948, after serving in a similar capacity at Brimsdown generating station. Previously he had served for lengthy periods in various capacities at Deptford East and Lots Road power station. Mr. Holt takes up his new duties next month.

*Mr. P. Holt*

**Mr. J. A. Esplin**, M.I.Mech.E., has joined the traction division of Crompton Parkinson, Ltd., at Chelmsford, as a senior traction engineer (railways). He joined the Buenos Ayres Great Southern Railway in 1924; in 1949, on the reorganisation of the ex-British owned railways, he was appointed chief of the electrical division of the General Roca Railway (former B.A.G.S.), and in 1951 technical adviser to the general manager. **Mr. W. R. Gordon** has been relieved of his present responsibilities in connection with trolleybuses in order to release him for special duties in connection with diesel-electric traction. The trolleybus section will be taken over by **Mr. A. A. Morris.**

The Government of India has appointed **Mr. A. N. Khosla**, I.S.E., to be the new chairman of the Central Electricity Authority in succession to Mr. B. K. Gokhale. Mr. Khosla was previously an additional secretary in the Ministry of Irrigation and Power. Earlier he had been chairman of the Central Waterpower, Irrigation and Navigation Commission. He was president of the Institution of Engineers (India) in 1948-49.

**Dr. F. H. Last**, Ph.D., B.Sc., has been appointed technical engineer (electrical) of the Eastern Generation Division of the B.E.A. After training at Queen Mary College, University of London and with Metropolitan Vickers Electrical Co., Ltd., Dr. Last joined the Research Department of the Central Electricity Board in 1939 and during the war transferred to the Technical Department of the South East England District. Since vesting day, he has been senior assistant to the technical engineer (electrical) of the Eastern Division.

*Dr. F. H. Last*

**Mr. T. E. Goldup**, M.I.E.E., has been elected chairman of the Radio Communication and Electronic Engineering Association for 1953 in succession to **Mr. K. S. Davies. Mr. C. G. White** remains vice-chairman. Mr. Goldup, a director of Mullard Ltd. (which he joined in 1923), is also a vice-president of the Institution of Electrical Engineers and chairman of the governors of the Ministry of Supply School of Electronics, Malvern, of which he has been a governor since 1949. His many activities include service on committees of the British Standards Institution and on the Radio Research Board of the Department of Scientific and Industrial Research. Mr. White is director and general manager of the marine division of Kelvin and Hughes, Ltd.

*Mr. T. E. Goldup*

## OBITUARY

**Mr. J. C. Hughes**, M.I.Struct.E., senior partner of the firm of consulting engineers of that name, died on March 11.

The death occurred in America on March 10 at the age of 92, of **Mr. Charles Gordon Curtis** who was internationally known in connection with his work on steam and gas turbines. He invented the impulse turbine and a pressure velocity compounded turbine, and many of his designs were adopted by the General Electric of America. It could in fact be claimed that, during the latter part of the last century, he played a major share in revolutionising the production of steam and electric power. A retired president of the International Curtis Marine Turbine Co., he was also credited with the invention of the first American gas turbine, for which he obtained a patent in 1899. In 1948 he received the first annual award of the gas turbine power division of the American Society of Mechanical Engineers for "pioneer work in the field of gas turbines." He also held a number of Diesel engine patents.

**Mr. Albert Hunt**, commercial manager of the Express Lift Co. Ltd., died on March 4, aged 53. He went to Northampton from Chatteris, starting as an estimating clerk with Smith, Major and Stevens Ltd., in 1929. On their amalgamation with the Express Lift Co. in 1930 he continued in the Sales Department and eventually became its head. During the war he was associated with the aircraft section of the company's war effort, and co-ordinated the work of four factories. With the return of peace-time production he again took over the Lift Sales Department and was appointed commercial manager.

**Mr. F. C. Faulkner**, a director of Electrical Services, Faulkner, Ltd., of Tunbridge Wells, died on March 9, aged 67.

# I.E.E. N.W. CENTRE DINNER

THE North Western Centre of the I.E.E. held their annual dinner early last week (March 10) at Manchester, with Mr. J. Prince in the chair. Over 400 members and guests were present.

Proposing the toast of the Institution of Electrical Engineers, Dr. E. J. F. James, High Master of Manchester Grammar School, chose as his theme the problem of modern technical education. The electrical engineer, said Dr. James, was at the heart of all modern industry. We existed in a new world dominated by scientific advances which we should learn to understand and control. Although this country had probably the best scientific ability in the world and would become increasingly dependent on this ability in the future, we had yet to obtain a really satisfactory answer to the problem of technical education. A major part in this solution must be played by the Institutions such as the I.E.E. which were at the root of national prosperity of industry.

Replying, Col. B. H. Leeson, President of the I.E.E., referred to the continued growth, both in membership and technical importance, of the Institution. The electrical industry today held a position in the export field second only to the motor-car industry. The staples of the future were engineering and engineering ability, and the potential contribution of the industry to economic recovery depended on an overall increase of production. Some of the benefits that would accrue from this increase in output should be devoted to furthering progress, improving education and transferring research discoveries into production entities. Care should, however, be taken to prevent material progress from overshadowing the importance of intellectual, moral and spiritual development, essential factors for man's well-being and happiness.

The Chairman proposed the toast of "Our Guests," and Dr. F. C. Toy responded. Mention was also made by Mr. Prince of the absence of Mr. Green, Asst. Sec., who was seriously ill, and a message had been sent to him from the centre, wishing him a speedy recovery. This was the first dinner of the N.W. Centre missed by Mr. Green in 50 years of office.

# Mechanical Rectifier shows L.V. Efficiency

WHERE rectification has to give a low voltage d.c. supply, the voltage drop in the rectifier used is a major factor in determining efficiency. For the mercury arc rectifier an arc drop of 15-20 V is usual. The mechanical rectifier, which has been mentioned before in these pages, operates with a voltage drop across its contacts of a few tenths of a volt only, and at 400 V the model made by the German A.E.G. concern has an overall efficiency (including transformer and auxiliaries) of 97·5%; at 100 V, of 96%.

### *Contact Mechanism*

Each individual contact device consists of two stationary contacts and a moveable disc. The closing and opening of the contacts is controlled by a camshaft similar to that of an automobile engine, which is rotated at a speed suitable for interrupting and making the circuit 50 times a second. With this frequency of operation continuing, in some cases, for months at a time (as with electrolytic plants) it is necessary to keep the contacts free from arc damage, and this is achieved by ensuring that at switching both current and voltage are zero. For this purpose, special commutating reactors with high-permeability nickel alloy cores are connected in series with the contact devices. Their effect is to restrain the current near its zero value for a definite period, during which arc-less commutation is possible. The voltage is similarly held down (for 0·01 sec after the switch is opened) by bridge-connected rectifiers across the contacts.

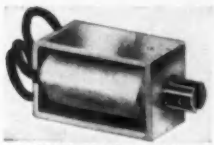
Because the nickel-iron alloy used is expensive, considerable ingenuity has been exercised in devising connections which will minimise the quantity required. The reactors used have the incidental advantage of reducing the sustained rectifier fault current to 7 or 8 times the a.c. current. They have been designed to withstand mechanical and thermal effects of short-circuits, the winding being cast in copper, while a surrounding aluminium tube is provided which is forced-air cooled. The contact arrangement is also forced-air cooled.

Voltage control is provided by tap-changing on the rectifier transformer, giving 5% steps, with fine regulation being given by d.c. magnetising of the reactors. A mechanical design point that has to be carefully watched is that of bearing size and lubrications. Techniques common in high speed i.c. engines have been applied.

# *The* BUYER'S *Column*

## Phil-trol Actuators

FIRST product to be marketed in this country by PHILLIPS CONTROL (G.B.) LTD., 273 Farnborough Rd., Farnborough, Hants, will be a range of Phil-trol actuators, types 41 and 42.



*Phil-trol Type 42*

These are of course made by the parent company Phillips Control Corporation of Joliet, Illinois, U.S.A. The type 41 is designed for application where space and weight are factors to be considered. 1 $\frac{3}{16}$ in. wide by 1 $\frac{7}{32}$ in. deep by 1$\frac{1}{4}$ in. long, type 41 has a maximum stroke of $\frac{3}{4}$ in. Type 42, which is 2 in. long, has a maximum stroke of $\frac{5}{8}$ in.

One piece of $\frac{1}{4}$-in. iron annealed at 1,400° F and furnace cooled is used in the construction of the frame, which is dovetailed and sealed into the end plate to ensure a secure bond. Standard coils of enamelled copper wire are wound on to a fibre bobbin. On the outside of the coil, relevant detail is clearly marked.

The frame and plunger stop are cadmium plated for protection against corrosion whilst the plunger is polished chromium plated for smooth action.

## Conductive Ceramic for Microwave Work

OF particular interest, in microwave work, is the conductive ceramic "Caslode," recently developed by THE PLESSEY CO., LTD., Ilford, Essex. A white, homogeneous material, it is capable of absorbing power at centimetre and millimetre wavelengths, and can thus be used effectively for high power dummy loads and attenuator pads in waveguide applications. "Caslode" is a true semi-conductor, and does not contain dispersed conductive particles as, for example, carbon in asbestos. At 3·2 cm wavelength its dielectric constant is about 20, and the loss angle 10° to 20°.

Its thermal shock properties are excellent, and its coefficient of linear expansion is $6 \times 10^{-6}$ per °C. Mechanically, "Caslode" is similar to porcelain but can be ground and shaped rather more readily. The raw materials are formed into the required shape before firing and precise dimensions and good surface finish are obtained by wet grinding.

High-power dummy loads of this material have been developed to meet the demand for a matched waveguide termination capable of absorbing high powers without the necessity for water cooling. Wedge shaped components have been designed to operate in the common sizes of waveguides.

The "Caslode" attenuator pad is still in the experimental stage, but units of the slot insertion type have been produced, having an attenuation figure of 28 db with a match of 0·95.

## Economic Cooking with the DC 752

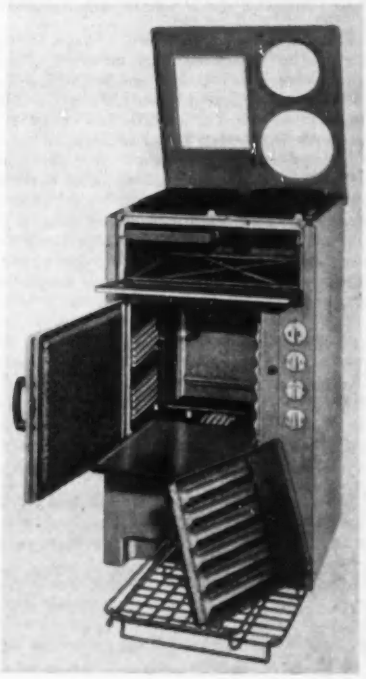
COOKING facilities for a family of eight persons are provided by the DC 752 Cooker, latest model to be introduced by GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, W.C.2.

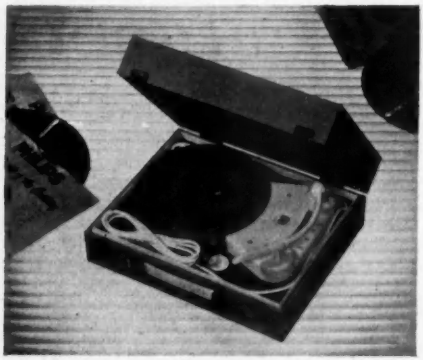
An extra large oven space sufficient for cooking a 21-lb turkey is a feature of this model. The oven is fitted with panel elements designed to combine efficient heat distribution with economy in consumption. It is equipped with a side opening door and GEC "Ovenmaster" automatic temperature control.

Hob equipment comprises one 8-in. and one 6$\frac{1}{2}$-in. boiling plate and a grill boiler measuring 10$\frac{1}{2}$ in. by 8 in. Both boiling plates and the grill boiler are fitted with three-heat control and are built in accordance with E.D.A.'s interchange ability specification. If desired, simmer control can be provided for the 8-in. boiling plate as an optional extra.

The cooker is available on legs (DC 752) at £28, or on a plinth (DC 753) at £29. Standard colour is mottled silver grey but, if desired, the plinth model is available in green and cream or two-tone ivory at a slight extra cost. Loading is 7,300 W.

*The DC 752 is easily dismantled for cleaning*





**The Philips Disc-Jockey**

PHILIPS ELECTRICAL LTD., Century House, Shaftesbury Avenue, W.C.2, announce the introduction of the first of their range of Record Players; it is Model No. 424A, known as the Philips "Disc-Jockey." The price is 11 gns. (tax paid). Supplies will be available as from the early part of April.

An outstanding feature of the "Disc-Jockey" is the Philips double stylus "Featherweight" pick-up. This pick-up is so light that the needle pressure is no more than one-third of an ounce. Yet this has been achieved without the need for a counter-balance because the complete tone arm weighs only three-fifths of an ounce.

The pick-up head has two Philips sapphire needles. The microscopically accurate grinding of these needles reduces needle scratch and "chatter" to a negligible level. One needle is used for the normal 78 r.p.m. records and the other for the long-playing types. These needles are brought into play by a slight turning of the pick-up head and therefore the single pick-up head is suitable for all records. The "Disc-Jockey" will accommodate any type of record whatever the run-off groove or label size. The turntable is operated by a special three-speed motor developed by Philips themselves. This is a precision built silent motor which is completely "rumble-free" and is suitable for all a.c. mains from 200-250 V and 110 V 50 c/s.

The Philips "Disc-Jockey" Model No. 424A is housed in a ribbed grey case which measures 13 in. by 11¼ in. by 4½ in. and weighs just 7 lb. It has a flush fitting handle and can be carried about in perfect safety due to felt cushions in the lid which hold turntable and pick-up in place.

## Price Reductions

THE retail selling price of the Hurseal TV ½kW portable panel electric radiator has been reduced to £8 19s. 6d. with a corresponding drop in purchase tax to £6 11s. 3d.

As from March 3 the list price of the Wolseley Clipvac vacuum-operated horse and cattle clipping machine is reduced as follows: Clipvac without tube, £6 10s.; Clipvac complete with 10-ft length of tubing, £7 3s.

## D.C. Bus Bar Relay Type XK

THIS new relay has been designed by LONDEX LTD., 207 Anerley Rd., London S.E.20, to meet the requirements of a signalling, control and alarm device for use with apparatus using high currents on d.c.

On a.c. this type of control usually presents no problem, as ring-type current transformers can be employed to reduce the working currents to manageable proportions. On d.c., however, it has been necessary to introduce shunts in the main lines, causing undesirable voltage drop.

As the unique construction of the XK relay obviates the need of a shunt, its installation becomes a matter of great simplicity. The magnetic circuit of the relay is designed to embrace the magnetic field of the current flowing in the main bus bar to which the relay is clamped.

Numerous applications for this relay are found in industries employing rectifiers, electrolytic processes and also in connection with specialised d.c. machinery as in traction and lift control.

The standard XK relay is designed for clamping on to a 4-in. by ⅜-in. bus bar.

One or two contacts can be fitted, either or both of which can be normally open or normally closed. The contacts are silver and 6 mm diameter, rated at 3 amp on 250 V a.c. or 1 amp on 440 V a.c.

The minimum current at which the relay operates is approximately 300 amp, but this can be increased if desired.

## Actol—a New Solder

A NEW rosin-cored solder has just been released under the name "Actol" by ENTHOVEN SOLDERS, LTD., Enthoven House, 89 Upper Thames Street, E.C.4, and although of pure rosin it is claimed to have physical characteristics which overcome the slow working action of ordinary pure rosin. It is completely chlorine-free, thus obviating a risk of corrosion.

The process by which the wetting and spreading power of Actol's rosin core is increased does not affect adversely its other properties. This process is described by the company as "vitalisation" which is a good description of the effect on the rosin. Its fluxing action is boosted and its one great disadvantage is overcome without any alteration to its chemical composition. Actol in use leaves a hard, non-hygroscopic residue of maximum insulation resistance.

A second important advantage of Actol, peculiar to Enthoven-cored solders, is its stellate core. This core shape designed for speedy flux release combines the benefit of a single core of flux of constant quantity with six points of rapid solder wall collapse. In this way immediate welling takes place and the release of flux and solder in correct and constant proportions is achieved.

Actol, which is A.I.D. approved, can be used on non-ferrous metals such as copper, brass and nickel silver and many electro-plated surfaces. It will be available in all standard tin/lead alloys in s.w.g. 10-22 in 7 lb 5 lb and 1 lb drums.

# British Standards

**Glossary of colour terms used in Science and Industry.** *B.S.* 1611: 1953. *Price 3s. 6d. net.* In view of widespread activities in which colour is involved, the British Standards Institution have published this glossary of colour terms, having for its object the definition and standardisation of such terms without including names of colours themselves. As it was found impracticable to refer to all colour terms used in everyday speech or having particular aesthetic associations, this glossary has been consequently restricted to terms used in the main in science and industry.

It is intended to provide a single consistent list of suitable expressions and, therefore, where two or more terms are used synonymously, a preference is given to that favoured, in an attempt to displace all others. In some cases, a synonymous term is marked "deprecated" where its use is considered undesirable. Terms have been arranged in logical sequence, with sub-sections grouping terms associated with particular ways of describing colour. Recourse has been made to the Report on Colour Terminology published by the Physical Society and many terms and definitions coincide with international standards laid down by the International Commission on Illumination.

**Neck and flange dimensions of interior lighting fittings.** *B.S.* 364: 1953. *Price 2s. 6d. net.* Revisions to this edition of B.S. 364 include extensions dealing with openings in shades and reflectors for both electric and gas lighting fittings. Also covered are neck and lug dimensions of bayonet pattern globes, or shades and galleries. Due regard has been paid to dimensions for electric lamps specified in B.S. 161 and to those of bayonet car lampholders given in B.S. 52.

# NEW LITERATURE

### *Lighting in Industry*

GOOD illumination is so essential a factor to peak productivity that it is no surprise to find the second volume in E.D.A.'s "Electricity and Productivity" series dealing with electric lighting. The approach adopted is an examination of proved methods by which illumination can help, the principal intention being to answer the queries of the works manager who is considering a change in his lighting arrangements.

First comes a general review of the relationship between lighting and productivity and of the economics of various schemes. Individual methods and the requirements of individual industries are then considered. Finally come chapters on maintenance, on the use of colour and on the elements of design. A series of appendices gives more technical details. Published by E.D.A., 2 Savoy Hill, London W.C.2, 154 pages, 8¼ in. by 5½ in. Price 9s.

### *Practical Industrial Electronics*

*by F. A. Annett*

THE use of electronic devices for counting and inspection and as functional operators in industrial processes, has increased rapidly in the past few years. Yet to many maintenance engineers the apparent complexity of electronic equipment is sufficient to make them fight shy of carrying out any direct maintenance work, and indeed of attempting to understand the fundamental principles on which such equipment operates. In this volume, however, Mr. Annett has written expressly for the many operating engineers confronted with these problems. He has approached the subject from a fundamental though non-mathematical viewpoint, and after explaining the operation of valves, the fundamental circuits and the performance characteristics required, goes on to deal with a variety of specific devices. The treatment is excellent, being well illustrated and easily understandable. Published by McGraw Hill Publishing Co., Ltd., 381 pages, 6 in. by 9 in. Price 47s.

### *Television and Radar Encyclopædia*

*edited by W. MacLanachan*

FOR engineers requiring a succinct glossary of the terms associated with the relatively new techniques of television and radar, this compact volume seems the very thing. In addition to the brief definitions of the more common terms, there are longer articles on the more general subjects. The language throughout is relatively simple, and free from unexplained jargon. Published by George Newnes, 216 pages, 8½ in. by 5½ in. Price 30s.

### *Thermionic Vacuum Tubes*

*by W. H. Aldous and Sir Edward Appleton*

METHUENS' series of monographs on technical and physical subjects, produced under the general editorship of Dr. B. L. Worsnop, fulfils an important need particularly as far as the university student or graduate engaged in specific research is concerned. Each volume contains a compact of the subject under review. In this case, the monograph has reached its sixth edition since its original publication in 1931, and now contains additional information on space charge control valves at u.h.f. and transit time valves. While it is neither a textbook nor is it devoted to practical applications, it is nevertheless most useful to those whose researches make it important for them to understand the principles, operation and associated circuits of thermionic valves. Published by Methuen and Co., Ltd., 160 pages, 4 in. by 6½ in. Price 9s. 6d.

# *The* WEEK in NEWS

## A Board extends Publicity Campaign

*Details of N.W. Area's Plan to Step-up Sales*

THE lifting of the ban on promotional advertising by Electricity Boards may be announced in the near future. An indication of such an eventuality was reported in these columns last week coinciding with the decision of the N. Western Electricity Board (among others) to step up their sales drives, thus obviating the need to raise tariffs to counteract the latest increase in coal prices. Some preliminary details of the sales campaign are to hand this week, although possibly the main factor in the drive, the new off-peak commercial tariff, had yet to be announced.

During the coming months shop-window lighting will be pressed, with particular emphasis on Coronation decorations. As regards shop window displays, every effort is to be made by special exhibits, literature and other means to develop the sale of electric blankets. A resumption of this campaign will of course wait until autumn. Water-heating, and the insulation of existing installations, use of storage heaters, and the development of the cooking load are other aspects of the campaign. Special attention will also be paid to publicising guarded fires.

Turning to outdoor activities, the Board will continue to advertise soil warming and light irradiation. In addition, all football clubs in the Area are to be circularised with the object of spreading floodlit soccer.

## STEEL PRICES UP

ANOTHER effect of the recent increase in the price of coal has been the rise of about 10s. per ton in the price of steel. This was announced last week by the Minister of Supply. The sum of 10s. a ton is an average figure, increases ranging from 13s. 6d. in respect of galvanised sheets to 6s. 6d. for low phosphorous pig iron. Not long ago the Iron and Steel Corporation pointed out that when iron and steel prices were adjusted about a year ago the full increase in costs was not passed on.

## Scottish Goods in U.S.

FOLLOWING closely on our report (last week) of the Engineering Industries' Association's proposal to set up a liaison office in Canada, we learn that the Scottish Council (Development and Industry) is suggesting that a team of men should go to the U.S. to sell Scottish goods. The suggestion has been made in the Council's magazine *Scotland*. The team would be armed with price lists, and other literature. Another proposal put forward is that groups of firms should get together for marketing purposes. This latter idea is being operated by four firms in Britain.

## *NEW BRITISH CO. HAS BEEN FORMED IN AUSTRALIA*

ARRANGEMENTS for the formation of British Insulated Callender's Cables (Australia) Pty. Ltd. have now been completed, it was announced in London last week. The board will be under the chairmanship of Sir T. Malcolm Ritchie and comprise prominent Australians and the company's resident executives. Registered office of the new company will be at 84-88 William St., Melbourne. Authorised capital is £A1 million, of which £A400,000 has been issued.

Hitherto B.I.C.C. has had offices in Melbourne and Sydney and agents in all State capitals and other cities. These branches and agents' activities will in future be co-ordinated. Main objects are to strengthen and expand selling and technical service organisation, co-ordinate trading interests and engage in construction and installation work in collaboration with B.I.C.C., Ltd. The formation of this new company will in no way affect arrangements made earlier for the setting up of the new factory of British-Australian Power Cables (Pty.) Ltd. at Port Kemble by Metal Manufacturers Ltd., and B.I.C.C.

### *The First Half-Century*

The comparative economy of electric transmission of power never comes into question when water power has been dealt with, for the simple reason that it is not possible to carry a waterfall by train. With a coal-fed power-house the case is different, and the relative merits of the electric line and the railway coal-truck as carriers of energy have always been a subject of more or less speculation. At Denver, in Colorado, the tramway company has had to consider the matter on a definite proposition, and has decided it in favour of the coal truck; but be it noticed of the coal truck not hauled by steam, but electrically.—*From our issue of March* 19, 1903.

## *Electricity is the Cheapest Fuel*

*Result of Small Inquiry carried out in Perth*

A SMALL-SCALE inquiry conducted by Perth County Council into the comparative costs of electricity, gas and solid fuel, has disclosed a distinct advantage in favour of electricity. Eight tenants were asked to submit their fuel accounts over the past year. It was found that in an all-electric house the year's bill amounted to £12 5s. 6d., in an all-gas house, the bills came to £13 17s. 10d., while in a house with a gas cooker and electric light the total sum was £15 11s. 8d. (comprising £8 0s. 6d. for gas and £7 11s. 2d. for electricity). In another house with a solid-fuel cooker and electric light, the amounts involved were £13 3s. 6d. for the cooker and £5 1s. for light. It was also shown from relative costs based on tenders for a house at Erroll, that a house with a solid-fuel cooker and wash-boiler was £40 more than an all-electric house.

This inquiry followed the Council's concern over the N. of Scotland Board's request for capital contributions towards installations in houses which were not all electric, the Board's failure to provide adequate power at all times in some parts of the county, and the Board's request for capital contribution towards the cost of providing power for street lighting.

In reply the Board has stated it would have to continue to seek capital contributions in respect of houses which were not all-electric, and also in street lighting installations, which at all times were found to be uneconomic. As regards electricity supplies the Board was continually seeking to improve the efficiency of its installations. The Council decided to press for the waiving of capital contributions in respect of street lighting otherwise it would be unable on economic grounds to continue its street lighting installations.

## E.T.U. Complaint Upheld

A PROTEST by the Electrical Trades Union that a local contractor was allowing an unqualified 19-year-old youth to carry out electrical installations in new council houses, has been considered justified by Alnwick Urban Council. Employers have been instructed to terminate the contract. In a letter to the Council, the Union alleged that the boy was not serving a bona fide apprenticeship, was working without supervision, and there was no qualified electrical engineer in the firm to give that supervision. It was also agreed by the council that an inspection of the work already done should be made by representatives of the Union, the National Federated Electrical Association, and the Council. Another subcontractor will be employed.

## *. . . But Electricity can be Expensive !*

WITH their quarterly bills amounting to the staggering amounts of £14 and £22, consumers in a Jarrow-on-Tyne council house had to sell much of their furniture and belongings in order to pay. Stringent economies also failed to make any impression on the huge accounts which continued to arrive each quarter since they moved in six years ago. Eventually it was found that the wiring was faulty. First bill since the wiring was put right amounted to £2 3s. 11d. and the Council has given them £30 compensation.

## CONFERENCE ON ACCUMULATORS

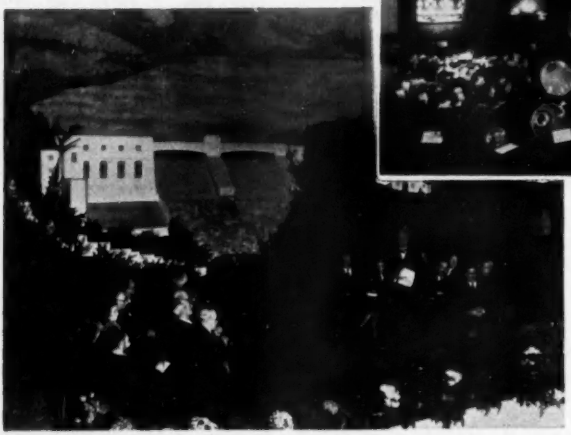
AN international conference o the licensees of The Yardney International Corporation, who control the world patents on the light-weight silver-zinc accumulator, made by Venner Accumulators Ltd., is to be held this month. This was announced by Venner last week-end. The conference is to take place in London and will be attended by licensees from this country, the U.S., France, Sweden and Germany.

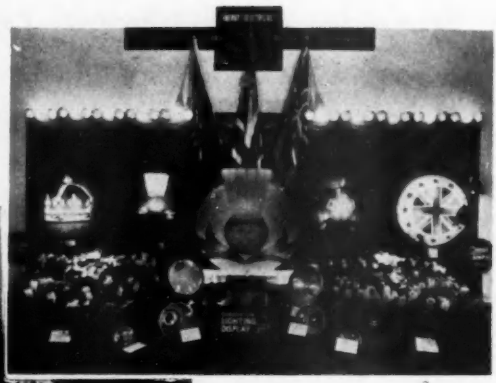
## Special Show for Eastbourne Caterers

A LONG-TERM policy of the E. Sussex and S.W. Kent subarea of the S.E. Electricity Board concerns the development of electrical catering equipment installations. Continuing that policy, the sub-area recently organised a special display in an Eastbourne café, main feature of which was a complete hotel kitchen layout. The kitchen was planned by Simplex Electric Co., who also supplied the cooking equipment, and a number of other manufacturers also contributed appliances. The Board provided descriptive notices and captions and in general put the plan into practice. The attendance of hoteliers and caterers in and around Eastbourne was most encouraging.

*General view of the kitchen layout at the Catering Trades Show organised by the S.E. Electricity Board at Eastbourne*

*Chairman of the N. of Scotland Hydro-Electric Board, Mr. Thomas Johnston, speaking during the opening ceremony of the Energy Electrical Exhibition in Perth last week. Afterwards he pressed a button and illuminated the model of Pitlochry Dam, in the background, causing 200 gallons of water a minute to pour over the spillways. Right, is a typical display of Coronation decorative lighting fittings and devices on show at the same exhibition*





## TWO ELECTRICAL SHOWS IN PERTH

IN each of the past three years, the N. of Scotland Hydro-Electric Board has staged a large exhibition. This year's, which has just closed, took place in Perth, where, appropriately, the local population is particularly interested in electricity, being in the midst of a changeover from d.c. to a.c. supply. That changeover, incidentally, is expected to be complete by the end of the year. Apart from that, however, it is estimated that the city and surrounding districts house some 66,000 potential consumers.

This exhibition was divided into two, one entitled the Energy Electrical Exhibition and the other the Agricultural Exhibition. The former accommodated about 3,000 exhibits, being well supported by over 70 of the country's best-known manufacturers. Accent was on domestic appliances and equipment for the home, but a further range of plant and equipment and other displays showed the Board's activities in all fields. A lighter side was provided by a junior section, an arts and crafts section and a cookery competition.

An excellent display of the latest machinery and equipment available to farmers emphasised economy and efficiency. Perthshire farmers were given encouraging news about the early extension of electricity supplies in the area.

## OFFICIAL PUBLICATIONS

N. OF SCOTLAND H.-E. BOARD. Annual report and accounts for 1952 (*see page* 542). H.M.S.O. 2s. 6d.

N. OF SCOTLAND H.-E. BOARD. Constructional Scheme No. 66. Breadalbane Transmission Lines. Confirmation Order and Explanatory Memo (*see page* 560). H.M.S.O. 2d. each.

IRON AND STEEL PRICES NO. 2 ORDER (*see page* 554). H.M.S.O. 2d.

ELECTRICITY INDUSTRY. Position in O.E.E.C. countries as at Feb., 1953, 3s. 6d. Also fuel consumption of thermal power stations in same, 2s. 6d. (*see page* 544). H.M.S.O.

TAX-PAID STOCKS. Report of the Committee on (*see page* 526). H.M.S.O. 1s. 9d.

E.R.A. REPORTS. G/T261: *Simplified Calculations for Rate of Rise of Restriking Voltage*, by J. A. Callow, 12s. 4d.; G/T266: *Performance of 440 V a.c. Cartridge Fuses with Small Over-currents*, by H. W. Baxter and M. T. Cree, 10s. 3d.; G/T268: *Intrinsically Safe Electrical Apparatus; Relation of Igniting Current to Circuit Inductance of Inflammable Mixtures of Benzene and Cyclohexane with Air*, by E. M. Guenault and E. Atherton, 6s. 3d.; L/T257: *Report on Researches with Ferroelectric Materials*, by H. F. Kay, 12s. 4d.;

## CABLE FOR THE ABBEY

A SPECIAL order for the lighting installation in Westminster Abbey has just been completed by Craigpark Electric Cable Co., Ltd., Glasgow. It involved the supply of 50 lengths of a specially produced steel-wire-cored, 6 cable-core, suspension cable for roof lighting. It has been designed to carry any weight up to 1½ tons and dispenses with the need for chains in the hanging of heavy fittings. Special attachments were used to complete the installation.

## Repair Bill Too Big

STRETFORD council is to make its tenants pay for repairing defects in all gas and electrical appliances. This decision has been made because the town can no longer afford to accept the responsibility of repairs, and reverses the undertaking to foot the bills given last November. If the council maintained the appliances, it has been stated, the cost would be reflected in the rent and would mean careful tenants subsidising the careless.

## S.E. Scotland Board's £180,000 for Rural Scheme

IT was proposed to spend about £180,000 on rural electrification during 1953-54 in the S.E. Scotland Electricity Board's Area, said Sir Norman Duke, at a public meeting at Kelso recently. Of that amount some £100,000 would be spent in the Southern Sub-area where development had been backward during and since the war. Expenditure would of course be subject to the capital permitted, he added. Sir Norman explained that rural electrification was a costly business and had therefore to be heavily subsidised by consumers in towns. He went on to say that despite difficulties, since April 1948, 880 farms had been connected in S.E. Scotland, bringing the total number of farms connected to 2,280. At the same time sales of electricity had increased from 8·2 million units to 21·3 million units in 1952-53. He went on to explain the difficulties of capital investment, supplies of materials and plant, and labour, and added that he foresaw little prospect of any large acceleration in the rate of rural development.

The Scottish Council (Development and Industry) who have formulated a comprehensive programme of development in the Border counties, are recommending a radical change of policy on the part of electricity authorities.

## Stamps Scheme May Extend to Yorkshire

THE scheme for paying electricity accounts by the purchase of "savings" stamps is spreading. Last week, the Yorkshire Electricity Consultative Council agreed to the suggestion that the Board should investigate the possibility of working such a scheme in the Area. Various methods of paying bills are in operation in the Area although the stamp scheme is not. In the No. 5 sub-area, consumers can pay fortnightly, and in the Castleford district, monthly. General opinion of members of the Council was that it was a simple scheme and would cost very little.

The Board's investigation should not take long as an example of the operation of the system may be found across their border in the N. Western Board's Area. There the scheme is being worked successfully.

## *Electricity's Relations with Other Industries*

THE role of electricity in other industries and a survey of modern developments in electrical engineering was given by Sir George Nelson, chairman of the English Electric Co. at a luncheon of the Oil Industries Club. Having outlined electricity's part in the oil industry, Sir George went on to speak of associations with the steel industry, radio, television, radar, of electronic computors, and of aeronautical and maritime developments. Dealing with atomic energy, he said the electrical world was not worried about the direct conversion of atomic energy at present. The only practicable field at the moment was the use of heat generated by atomic fission to produce steam. Subsequently, he continued, steam would be passed to ordinary steam turbines to generate electricity, but even then the cost would be high.

## ZEBRA CROSSINGS

### *Westminster Puts Case to Ministry*

A DEPUTATION from Westminster City Council last week met representatives of the Ministry of Transport to discuss the objections raised by the Council to the installation of flashing lights at pedestrian crossings. Two M.P.s, Sir Harold Webbe and Sir Edward Keeling, were among members of the deputation. It will be recalled that Westminster considers the lighting of zebra crossings unjustifiable before more extensive experiments for giving prominence to the crossings have been carried out. Main objection is one of cost which has been calculated to be far in excess of the Ministry's estimates. The Metropolitan Boroughs Standing Joint Committee, at their meeting on March 2, declined to support the City Council's plea, it being too late to raise objections in principle. It is understood that a further meeting between the City Council and the Ministry is to be held in the near future to discuss the circumstances peculiar to Westminster. Next meeting of the Council is on April 23 when the Roads and Traffic Committee will probably submit their report of proceedings.

*Photograph shows Mr. G. Kingsley-Lark, chairman of Newcastle Centre of I.E.S., proposing the Toast of The Guests at the Centre's annual dinner and dance held on March 6. With the chairman (from left to right) are Mrs. Kingsley-Lark, Dr. W. J. Wellwood Ferguson, president of the Society, Mrs. C. A. Harding, wife of president of Northern Architectural Association, and Mrs. Wellwood Ferguson*

## POST INSULATORS

READERS of our article, published on March 12, on post insulators, designed to the B.E.A. specification for the 275 kV network, may have gained the impression that these were the concern of one firm alone. In common, however, with other components being manufactured for this e.h.v. system, the development of these items, and their manufacture, is the responsibility of several manufacturers, particulary Messrs. Taylor Tunnicliffe and Co. Ltd., and Messrs. Bullers Ltd.

## Housecraft Advisers' Conference

LORD CITRINE is to open the four-day annual conference of Housecraft Advisers and Senior Demonstrators, organised by E.D.A. and E.A.W. The conference opens next Tuesday. Altogether there will be six talks, as well as Miss M. Marris' discourse on her visit to Norway after gaining the 8th Caroline Haslett Trust Exhibition. There will be demonstrations for cooker sales, and of small appliances, and a display of deep freeze packaging. Visits to the E.D.A. section of the Building Centre, the Ideal Home Exhibition and Electrical Engineering Exhibition have also been arranged.

## *H.P. Scheme for Refrigerators Considered*

A SCHEME to borrow £5,000 in order to finance the hire purchase of about 100 refrigerators by council house tenants is being considered by Bury St. Edmunds town council. It has been approved in principle, but when authority was sought last week to borrow the money, the scheme was challenged and a motion put to defer the matter. The motion was defeated. Main objections to the scheme were that the privilege would not be freely available to all ratepayers, and that a payment of two-thirds purchase tax was involved at a time when the tax may be reduced.

## Council Asked to Fit Electric Cookers

IT is reported from Lanarkshire that a local electric cooker manufacturer has asked the County Council to install more electric cookers in houses under their control. The request has been made by British National Electrics, Ltd., who, because of a fall in demand for cookers, have been obliged to reduce the number of workers at their factory at Newarthill, the report states. We understand that the matter has been referred to a sub-committee for special consideration. The report goes on to quote an official of the company as saying that the request was quite a normal one.

## NEWS IN BRIEF

Weekend course for E.A.W. Home Workers' Examiners and Lecturers took place recently at Horsley Towers, the B.E.A.'s training establishment in Surrey.

During their visit to this country, the team of experts of O.E.E.C. Intra-European Mission visited the Lewisham and Rochester factories of Elliott Bros. (London) Ltd., and Fisher-Governor Co. Ltd.

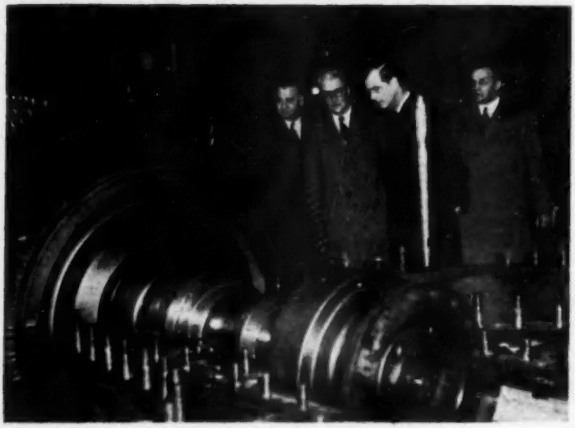
Floodlit football is now being played at Fratton Park, home of the Portsmouth Football Club. Floodlight equipment was supplied by Simplex Electric Co. Ltd., and installation carried out by Haslemere Radio and Electrical Co. Ltd.

A 5 amp Venner ultra-lightweight silver-zinc accumulator was used by two New Zealanders who recently broke the world's record for a duration flight with a model aircraft. It kept airborne for just over an hour.

A Sussex area committee of the National Union of Manufacturers was formed after Sir Patrick Hannon, president, and Sir Leonard Browett, director, had addressed a meeting of 17 Sussex manufacturers at Brighton last week.

Chairman of Blackpool Illuminations Committee will judge the best "Illuminated Premises" Competition during Skegness's display between July 11 and October 19.

The B.B.C. has ordered three pairs of medium-power vision and sound transmitters for stock from Marconi's Wireless Telegraph Co., Ltd.



*Our photograph shows the Duke of Edinburgh during his visit to Littlebrook power station last Friday. The Duke is seen inspecting a turbine undergoing maintenance at the 'A' station. With him (from left to right) are Mr. W. C. Parker, divisional controller, Mr. E. C. Avery, station superintendent, and Sir John Hacking*

# Questions in Parliament . . .

**Breadalbane Scheme**

Late on Wednesday evening, last week, a debate was initiated of the North of Scotland H.E. Board's Breadalbane project that continued until the early hours of Thursday morning. The general view of the opponents of the scheme (led by Col. A. Gomme-Duncan) was that the money to be expended on the scheme could be more usefully applied to other schemes in Scotland, but they made it clear that they did not mean to press their criticisms in a division.

A more antagonistic attitude was taken by Mr. G. Nabarro, who argued that the scheme was unduly costly in comparison with steam stations (he suggested £204/kW compared with £60/kW), and that its load factor at 40% was unreasonably low. He further suggested that the long life of the project would be of little value, as nuclear power generation would render it obsolescent within 30 or 40 years.

Mr. Nabarro was answered by Mr. A. Woodburn and Mr. A. M. Palmer. The former quoted the conventional arguments for the overall N.of.S. H.E. Board developments, while the latter disputed the technical accuracy of some of Mr. Nabarro's statements, in particular the real significance of load factor, and emphasised the man-power advantages of hydro-electric schemes. The Minister concerned (Mr. Stewart, Jnt. Under-Sec. of State for Scotland) specifically refrained from entering into technical arguments, but recommended the scheme on various general grounds, and after some other speeches the prayer to annul the relevant orders was negatived.

**Coal Price Increase**

Mr. Geoffrey Lloyd, in a written answer last week, stated that the Government considered an enquiry into coal prices, etc., would serve no useful purpose and would hinder efforts to increase production.

**Space Heating and Insulation**

Replying to a question by Mr. Grimond, the Minister of Housing stated that a list of tested and recommended solid fuel appliances had been agreed, and it was a condition of approval of tenders for local authority house building, that appliances were selected from that list. As regards insulation, the Minister said a further circular would be sent out on desirable standards for the insulation of walls and roofs.

**Television Interference**

The matter of taking action against owners of television sets which caused interference was raised at question time last week. Informed that the condition under which a licence was issued was that the set did not cause interference, Mr. G. Williams asked if the Assistant Postmaster-General would take action against "certain sets" which did cause interference. Mr. Gammans said he would investigate actual cases made known to him.

**Power Station Capacity**

Total capacity of power stations in Scotland was 1,680 MW at the end of 1952, Mr. Joynson-Hicks stated in a written answer last week.

**Electricity Supply in Scotland**

Secretary of State for Scotland told Mr. Palmer that he was unable at present to make a statement on possible legislation affecting the supply of electricity in Scotland, mentioned in the Queen's Speech. Replying to a supplementary question put by Mr. Nabarro, he said the installed capacity of generating plant owned by the N. of Scotland Board on December 31 comprised 391 MW hydro-electric plant, 131 MW steam plant, and 38 MW diesel plant.

**Industrial Fuel Efficiency**

Parliamentary Secretary to the Ministry of Fuel and Power said last week that the committee set up to consider methods of providing a more effective fuel efficiency advisory service for industry had not yet reported. He added that the report would probably be available in the near future.

**P.T. on Electric Vehicles**

Sir W. Wakefield pointed out that sales of electric vehicles had fallen over 200% during the past six years, due mainly to the imposition of purchase tax, he claimed. He asked that the tax be removed on the grounds of the vehicles' utility purpose, saving in dollars because they were powered by electricity, and their consumption of off-peak electricity. Mr. Boyd-Carpenter said representations had been received but he could not anticipate the Budget.

**Monopolies Commission**

Giving some information on the current work of the Monopolies Commission, Mr. P. Thorneycroft said he hoped to receive the report on non-ferrous metal semi-manufactures shortly, and on imported timber later in the year. He declined to say when other inquiries would be completed or what other references would be made. The Minister also refused to make further comments on legislation to strengthen the Commission.

**P.T. Anomalies**

A number of questions on purchase tax were asked last week. In the first place the Chancellor was requested to remove some of the anomalies pointed out to him recently. Mr. Boyd-Carpenter said the matter was being borne in mind. Replying to another question, he refused to set up a committee to advise on those anomalies and on those necessities which should be relieved of the tax. Mr. Boyd-Carpenter also said he had read Brig. Clark's letter urging the removal of P.T. from essential articles in everyday use.

# Electric Supply News . . .

**Axminster**

The South Western Electricity Board has told the rural council that in the present circumstances they would be unable to provide a supply to Hawkchurch. A survey of the district made in August, 1949, showed that the minimum terms on which the Board could afford to undertake the scheme would require line rentals averaging £25 per consumer, in addition to the charges for the energy used. Since then the cost of materials and labour have increased considerably.

**Chadderton**

The B.E.A. is inviting tenders for the construction of the foundations and superstructure of the second half of the Chadderton generating station.

**Easington**

The rural council has approved plans by the North Eastern Electricity Board for the erection of three substations at Easington Colliery in connection with plans for improving the district's electricity supply.

**Haltwhistle (Northumberland)**

The rural council is asking the B.E.A. to move the proposed 275 kV overhead line in their area about half a mile further north to avoid Allotment Farm. The line, part of a new system to be erected to connect Stella with Carlisle, has already had its route amended in the South Tyne area.

**London**

The Health Committee of the London County Council having reported on the increased death rate arising from the heavy fogs in early December, the Rivers and Drainage Committee has studied the general question of atmospheric pollution in London. The L.C.C. is now recommended to ask the Ministers of Health, Housing and Local Government, and Fuel and Power to set up a committee of independent scientific and medical experts to inquire into atmospheric pollution and fog. It is suggested that this committee should advise on measures to protect health and property and inquire also into the general question of sulphur emission from large coal-burning installations such as power stations, particularly on the desirability of installing gas washing plants to reduce sulphur emission. The Rivers and Drainage Committee point out that within the county there are 20 power stations. In South-west London about 65% of the coal burnt in an area of 20 square miles is burnt at the Battersea, Fulham and Lots Road power stations.

**Neath**

Answering complaints of alleged irresponsibility in its treatment of footpaths in the borough, a deputation of officials of the South Wales Electricity Board has explained to the Borough Highways Committee that since vesting day the Board had spent £167,000 on cables, transformers and switchgear in Neath borough, and £300,000 in the Neath area which included the rural district. Mr. G. R. T. Edwards, sub-area manager, pointed out that the old system was obsolete and had had to be replaced, otherwise it might have collapsed. This entailed new cabling and the replacement of switchgear and transformers in most of the substations. To do this it had been necessary to dig up pavement. The Board knew they were unpopular as a result, but they were not the only culprits, though they got the greater part of the criticism. Mr. Edwards hoped the council would be patient with the Board, for though the backbone of the work was practically broken, much remained to be done.

**N. of Scotland**

The scheme prepared by the North of Scotland Hydro-Electric Board for the transmission system linking the Board's seven power stations in the Breadalbane project and one in their Lawers project to the existing transmission lines at Killin and Luib, has been approved by the Secretary of State for Scotland. The works in the scheme include the erection of overhead lines in the parishes of Killin, Kenmore, Balquhidder, Comrie and Fortingall. Cost is estimated at £865,000.

**Tilbury**

Formal notice is given that the Minister of Fuel and Power is to lay before Parliament the B.E.A.'s Tilbury Compulsory Purchase Order, 1952, which he has confirmed.

## LIGHTING SCHEMES

**Brentford and Chiswick.**—The Council is to install improved lighting on the Great West Road at a cost of £20,000.

**Darwen.**—Borough engineer to prepare a scheme for lighting Bog Heigh Road and Hollins Grove Street.

**Newcastle-under-Lyme.**—T.C. recommended to invite tenders for the provision of street lighting at housing estates at Earl Drive, Crackley Bank, and Park Site, Silverdale.

**Northampton.**—The Highways Committee propose to include Broad Street and Horsemarket in the second stage of the lighting programme.

**Plymouth.**—T.C. recommended to approve conversion of lighting on 18 roads from gas to electricity.

**Scarborough.**—The Water and Streets Committee has approved a £6,000 scheme for the conversion of street lighting from gas to electricity from the Westborough end of Pavilion Road, across the Valley Road and into Ramshill Road.

**Ulverston.**—The U.D.C. has asked the North Western Electricity Board to prepare a comprehensive scheme for the electrical lighting of the whole of the Council's district.

# Company Activities . . .

### Cambridge Instrument Co.

Nearly £100,000 increase in the trading profit for 1952 is reported. The total is £491,470 as against £394,637 for 1951. Taxation at £293,196 absorbs over £40,000 more than for the previous year. The final Ordinary dividend of 6d. per £1 share makes the total 3s. 6d., tax free.

### E. K. Cole Ltd.

The proposed issue to the 5s. Ordinary shareholders of one new share for every six held, involving the capitalisation of £42,010 15s. of the undistributed profits of the company, to which we briefly referred last week, is intended as a further step towards bringing the nominal issued share capital into line with that actually employed in the business. The new shares will rank *pari passu* in all respects with the company's existing Ordinary stock except that it will not entitle the holders to the interim dividend already declared which is payable on April 1.

### Hubert Davies and Co.

This well-known South African electrical concern is paying a final Ordinary dividend of 20%, making the total distribution for the year ended October 31 last of 27½% (*same*). The group profit at £495,105 is £18,292 down on the previous year, and after charging taxation, etc., the net profit becomes £304,600 (*£345,124*).

### Electricity Board for Northern Ireland

An issue of £2,000,000 of 4½% stock 1968-71 was offered on Monday last at £99 per cent. The loan is to be applied almost wholly in replacement of the Board's short-term borrowings. Interest will be payable on January 1 and July 1, the first payment being 15s. per cent. on July 1 next. The new stock is guaranteed as to principal and interest by the Ministry of Finance for Northern Ireland.

### A. H. Hunt (Capacitors) Ltd.

The slight drop in the trading profit last year is apparently considered not unsatisfactory in view of the complicated nature of trading conditions during the period. The company enjoys

| Year to Dec. 31 | £ Trading Profit | £ Net Profit | % on Ord. Earn'd | % on Ord. Paid | Ord. Price High | Ord. Price Low |
|---|---|---|---|---|---|---|
| 1948 | 92,720 | 29,966 | 44 | 22½ | 14/- | 10/- |
| 1949 | 79,377 | 22,599 | 33 | 22½ | 11/1 | 9/6 |
| 1950 | 157,283 | 55,228 | 80 | 25 | 11/10 | 9/5 |
| 1951 | 195,015 | 60,091 | 78 | 25 | 13/9 | 11/7 |
| 1952 | 158,041 | 40,606 | 53 | 25 | 13/1 | 10/9 |

very wide export interests, but Mr. S. H. Brewell, chairman, reports that in spite of many adverse influences in some of these fields, there was no deterioration in its over-all export position. The present level of manufacture is encouraging and plant and equipment has been kept up to date and efficient so far as the present heavy burden of taxation will permit, he adds.

### International Combustion (Holdings).

Further criticism of the penal taxation burden on industry is made by Mr. G. R. T. Taylor, chairman, in his review of this company's operations during the year ended September 30 last. Certainly he has good grounds for doing so, for,

| Year to Sep. 30 | £ Trading Profit | £ Net Profit† | % on Ord. Earn'd | % on Ord. Paid | Ord. Price High | Ord. Price Low |
|---|---|---|---|---|---|---|
| 1948 | 510,048 | 175,417 | 88 | 37½ | 55/- | 39/3 |
| 1949 | 664,993 | 268,021 | 54• | 21• | 20/6 | 15/9 |
| 1950 | 1,052,970 | 369,118 | 75 | 20 | 17/4 | 14/9 |
| 1951 | 1,222,509 | 537,734 | 115 | 25 | 24/- | 15/9 |
| 1952 | 1,530,260 | 464,642 | 44• | 20‡ | 12/10 | 9/3 |

†Available for parent company. • On larger capital.
‡ Final 10% on increased capital.

as will be seen from our accompanying table, although there was an increase of over £300,000 in the trading profit all this and more is taken for taxation, leaving a net profit over £70,000 less than the previous year's figure. Taxation, in fact, takes £1,115,761 compared with £724,604 in the previous year. Output during the past year constituted a record, and Mr. Taylor states that the total of unexecuted orders of the group, which includes many for overseas, is higher than it was at the corresponding time last year. Subject, of course to world happenings, he can see no immediate recession in the business.

### Midland Electric Manufg. Co.

The substantial increase in the trading profit for last year's operations is shown in the accompanying table. Mr. W. L. Barber, chairman, states that the year was a record one for both value and

| Year to Dec. 31 | £ Trading Profit | £ Net Profit | % on Ord. Earn'd | % on Ord. Paid | Ord. Price High | Ord. Price Low |
|---|---|---|---|---|---|---|
| 1948 | 287,585 | 115,739 | 136 | 35 | 8¾ | 7¾ |
| 1949 | 287,959 | 117,891 | 46 | 12½• | 8¾ | 7¾ |
| 1950 | 328,207 | 129,616 | 51 | 15 | 58/- | 52/9 |
| 1951 | 376,841 | 138,611 | 57 | 15 | 67/- | 56/3 |
| 1952 | 477,080 | 155,811 | 65 | 15 | 60/6 | 52/3 |

• Capital bonus plus 200%.

volume of output. The record results achieved have been obtained only by greatly increasing export sales. But during the latter part of the year many restrictions and difficulties arose in several important overseas markets and these all were having their impact on current trading, he warned.

### Rheostatic Co.

An increase in the net profit, and of the dividend for the year to September 30, 1952, is announced. The net profit is £44,585 compared with £37,742 for the previous year; and the final dividend is 15% (*12½%*) making a total of 19% for the year, against 16¼% for the preceding period.

### Dividend Declared

*G. D. Peters and Co., Ltd.*—Final dividend 7½% plus cash bonus of 5%, making a total of 20% (*17½%*). Net profit is £86,976 (*£78,942*).

# Commercial Information

## CONTRACTS OPEN

### HOME

**Mar. 20.—Hemel Hempstead T.C.** Supply of electric lamps required during fiscal year 1953-54. A. H. Turner, Borough Engineer, Market Square.

**Mar. 20.—Huddersfield T.C.** Electrical work in filter house to be constructed at Holmbridge. Documents from Waterworks Engineer, 24 Ramsden St. Deposit £1 1s.

**Mar. 21.—Staffordshire.** Electrical repairs and installation work in schools at Bilston, Darlaston, Wednesbury, Wednesfield and Willenhall. (State district(s)). Div. Education Officer, Walsall St., Wednesbury.

**Mar. 23.—Brownhills U.D.C.** Supply and erection of about 68 mercury lamps on steel and concrete columns and brackets (class A) along A452, London-Holyhead Rd. Engineer and Surveyor, Coombe House. Deposit £2 2s.

**Mar. 23.—Willesden T.C.** Contractors wishing to be included on council list for installation of electric lighting and power work should apply by above date to J. C. Morris, Borough Engineer and Surveyor, Town Hall, Dyne Rd., Kilburn, N.W.6.

**Mar. 24.—Barnsley T.C.** Supply of tower wagon and 10-cwt. van with ladder fittings. A. E. Gilfillan, Town Clerk, Town Hall. (See March 5 issue.)

**Mar. 24.—Ilford T.C.** (*a*) supply of 158 140 W sodium lanterns, lamps, jackets and control gear, and (*b*) supply, erection, etc., of 158 concrete columns and installations of lanterns, etc. Borough Engineer and Surveyor, Town Hall. Deposit £2 2s. for each contract. (See Feb. 12 issue.)

**Mar. 24.—Manchester.** Electrical installation in shops, maisonettes, etc., at Brooklands Main Centre, Wythenshawe. City Architect, Town Hall. Deposit £1 1s. (See March 5 issue.)

**Mar. 24.—Wigan T.C.** Electrical work in council's housing schemes. Borough and Water Engineer, Municipal Buildings, Hewlett St.

**Mar. 25.—Newcastle-on-Tyne.** Electrical installation in (*a*) 42 flats in Armstrong Rd., (*b*) 48 flats on Fairways estate, and (*c*) 60 flats on Longbenton estate, City Architect, 18 Cloth Market.

**Mar. 25.—Rochdale T.C.** Laying of about 5,000 linear yd. of street lighting cable. Borough Surveyor, Town Hall.

**Mar. 26.—Kidsgrove U.D.C.** Provision and erection of about 38 concrete columns and 400 W mercury discharge lamps for street lighting in The Avenue. Engineer and Surveyor, Town Hall, Deposit £1 1s.

**Mar. 27.—Westhoughton U.D.C.** Supply and erection of about 132 concrete columns and 75 steel brackets in Bolton Rd., as well as installation and wiring of fittings and auxiliary equipment. Also supply of enclosed reflector-type lanterns, lamps, etc. F. H. Walker, Engineer and Surveyor, Town Hall. Deposit £2 2s.

**Mar. 27.—Windsor T.C.** Electrical installation in 44 flats on Manor Farm site. Borough Engineer, Kipling Building, Alma Rd.

**Mar. 28.—Cork.** Supply of electrically operated tidal penstock for sewerage scheme at Glanmire. E. Callanan, county secretary, Council's Offices, 7 Fr. Mathew Quay, Cork. Deposit £5.

**Mar. 28.—Northern Ireland.** New electrical installations and alterations to existing l.t. overhead service mains at Londonderry Chest Hospital. W. and M. Given, Architects, 1 Waterside, Coleraine. Deposit £5 5s.

**Mar. 28.—St. Neots U.D.C.** Installation of electricity in 20 houses in Almond Rd. Surveyor to Council, Council Offices, Huntingdon St. (See March 12 issue.)

**Mar. 28.—Isle of Ely.** Electrical equipment, including fires, radio sets and loudspeakers, wiring, etc., for old people's homes. R. F. G. Thurlow, Clerk, County Hall, March.

**Mar. 28.—Rochester.** (*a*) Supply and erection of steel columns, brackets, lanterns, etc., for 20 points along Gravesend Rd., and (*b*) erection only of concrete columns, and supply and erection of lanterns, etc., for 66 points along Maidstone Rd., Gun Lane, Cuxton Rd. and Rochester Esplanade. City Surveyor, 66 Maidstone Rd. Deposit £2 2s.

**Mar. 30.—Carmarthenshire.** Installation of electric lighting on two roundabouts adjacent to Carmarthen Bridge. J. L. Richards, County Engineer and Surveyor, Roads and Bridges Dept., County Hall, Carmarthen. Deposit £2 2s.

**Mar. 30.—St. Helens T.C.** Supply, erection and wiring of 63 concrete columns with 400 W H.P.M.V. lanterns for street lighting. M. Ward, Borough and Water Engineer, Town Hall. Deposit £2 2s.

**Mar. 30.—Litherland U.D.C.** Supply and erection of concrete columns with all lighting equipment for street lighting on Netherton Park estate. Engineer and Surveyor, Town Hall. (See March 12 issue.)

**Mar. 31.—Durham.** Electrical installation in Haswell county, Ushaw Moor county, Ryhope Robert Richardson grammar, and Newton Aycliffe New county junior schools. Applications by above date to County Architect, Court Lane.

**Mar. 31.—Gosforth U.D.C.** Supply and erection of equipment for provision of 93 electric street lighting units. C. Wyld, Surveyor, Council Offices. Deposit £1 1s.

**April 1. — Newcastle-on-Tyne.** Electrical installation in £30,000 scheme for converting Jesmond Dene House into school for subnormal girls. City Architect, 18 Cloth Market. Deposit £2 2s.

**April 3.—Carlisle.** Electrical installation at Harraby junior school. City Surveyor, Fisher Street.

**April 3.—Sutton Coldfield T.C.** Supply and erection of 63 mercury discharge lamps on concrete columns and brackets to Group A standard along Chester Rd. Borough Surveyor, Council Offices. Deposit £2.

**April 4.—Amble (Northumb.) U.D.C.** Electrical installation in 26 houses to be built on Links estate. Surveyor's Dept., Council Offices.

**April 6.—Louth T.C.** Floodlighting of parish church of St. James's at a cost of £450 (approx.). John T. Chenery, Town Clerk, Town Hall.

**April 8.—Lisburn U.D.C.** Supply and installation of four electric motors to pumping plant at Sewage Disposal Works, Tullynacross. Surveyor's Office, Town Hall.

**April 8.—Manchester.** Electrical installation in waste utilisation plants at Grimshaw Lane Cleansing Depot, Newton Heath. City Architect, Town Hall. Deposit £1 1s. (Advertised in this issue.)

**April 8. — Newcastle-on-Tyne.** Electrical installation in 84 flats on Montagu estate and 72 flats on Blakelaw estate. City Architect, 18 Cloth Market.

**April 10.—Belfast.** Supply and erection of drainage pumping equipment including 600 g.p.m. pumps, motors, pipes, valves, lighting tackle, etc., for Victoria power station. Merz and McLellan, consulting engineers, Carliol House, Newcastle-on-Tyne. Deposit £5 5s. (See Feb. 26 issue.)

**April 10.—Crosby T.C.** Installation of sodium lighting to Group A in College and Coronation Rds., about 2,080 yd. Names to Borough Engineer and Surveyor, Town Hall, Waterloo, Liverpool 22.

**April 14.—Islington B. C.** Installation of fluorescent lighting, wiring, etc., in Essex Rd. library. Borough Engineer and Surveyor, Town Hall, Upper St., N.1. (See March 5 issue.)

**April 24.—Manchester.** Electrical installation in Openshaw College for Further Education in Whitworth St. City Architect, Town Hall. Deposit £1 1s. (See March 12 issue.)

## OVERSEAS

*Details of items marked • may be obtained on application to the Board of Trade, Horse Guards Avenue, S.W.1, quoting reference.*

**April 9.—Portuguese E. Africa.** Supply of electrical equipment for transformer cabin at Vila Pery. Ports Railways and Transport Admin., Almoxarifado de Fazenda, Lourenco Marques. B.o.T. (Ref.: CRE 7639/53).•

**April 21.—Uruguay.** Supply of 180,000 incandescent electric lamps to various specifications for Usinas Electricas y Telefonos del Estado. B.o.T. (Ref.: CRE 7631/52).•

**April 22.—Portuguese W. Africa.** Supply of 32 kilometres of armoured cable to various specifications. Luanda Light and Water Supply Board, Angola. B.o.T. (Ref.: CRE 8868/53).•

**April 28.—New Zealand.** Post Office requires supply of 12 miles of textile covered, lead sheathed telephone cable as follows: Auckland, 1 mile; Wellington, 4½ miles; Christchurch, 4; and Dunedin, 2½. B.o.T. (Ref.: CRE 9118/53).•

**April 30.—New Zealand.** Supply of 200 miles p.v.c. cable, insulated 2-wire (internal wiring) as follows: Auckland, 68 miles; Wellington, 107; Dunedin, 13; Christchurch, 12. Director-General (Stores Div.), G.P.O., Wellington.

**May 6.—South Africa.** Supply of two dual ratio transformers, each having continuous maximum rating of 30,000 kVA at higher ratio of transformation and 15,000 kVA at lower ratio. Capetown City Electrical Engineer, Electricity House, Strand St., Capetown. B.o.T. (Ref. CRE 9644/53).•

**May 11.—Kenya.** Supply of 4 electrically driven pump units, one diesel oil fuel engine driven pump, and one electrically driven disintegrator pump for Nairobi River Valley (sewage) pumping station. Motors should be slip-ring and protected types suitable for 415 V 3-phase, 4-wire 50 c/s with minimum power factor of 0·75. Documents from City Engineer, Town Hall, Nairobi. B.o.T. (Ref.: CRE 8134/53).•

**May 13.—Australia.** State Electricity Commission of Queensland invites tenders for supply of switchgear to Rockhampton station, under Capricornia Electricity Board. Commission is at Scottish Union House, Eagle St., Brisbane. B.o.T. (Ref.: CRE 7947/53).•

**May 13.—S. Rhodesia.** Supply of transformers, up to and including 88 kV and spares, oil-immersed, 3-phase double-wound core-type suitable for outdoor use. Electricity Supply Commission, P.O. Box 377, Salisbury. B.o.T. (Ref.: CRE 7850/53).•

**June 23.—New Zealand.** Manufacture and supply of two 30,000 kVA, 110/33 kV transformer banks and spares for Henderson and Albany substations. Documents from High Commissioner in London, Adelphi Building, John Adam St., W.C.2.

**No date stated—Uruguay.** Supply of 58,000 metres of armoured cable and accessories for Usinas Electricas y los Telefonos del Estado. B.o.T. (Ref.: CRE 6729/53).•

## *Your Queries Answered*

**"Ajon" heated food cabinets,** makes of? B.C.—Jones, Son and King, 31 Haroldstone Rd., Walthamstow E.17. (25239)

**Cylinder for spraying the patient's face as depicted in Fig. 4 of our placard of "Instructions for Treatment of Electric Shock,"** makers of? S.G.—Sparklets Ltd., Queen St., London N.17. (25246)

**Cone Fittings Co., makers of lighting fittings,** address of? W.J.—297 Mutton Lane, Potters Bar, Middx. (25253)

**"Sector" vacuum cleaners,** suppliers of? S.T.—Electrical Components Ltd., 102 Snow Hill, Birmingham 4. (25258)

**"E.S.A." kettles,** makers of? T.B.—E.S.A. (Yew Tree) Ltd., 43 Yew Tree Rd., Birmingham 3. (25264)

**"Intermains" intercom unit,** makers of? T.E.—E. Shipton and Co., Ltd., Ferndown Works, Pinner, Middx. (25271)

**"Mixmaid" mixers,** suppliers of? L.E.—Tide Electrical Co., Ltd., 34 High St., Southall. (25277)

*The above are selected from questions we have answered this week. If you have a query, send it to us.*

## CONTRACTS PLACED

**Durham.** Electrical work in civil defence centres at Billingham (£1,363) and Jarroe (£1,367), Doves (Darlington) Ltd.; same at Felling (£1,234), A. F. Jamieson.

**Glasgow.** Supply of 200 fuse renewal units, British Manufacturing Co., Ltd., £1,247.

**Hull.** Electrical installations in 185 houses in Sutton No. 2 Residential Area, Booker and Tarran Ltd., £4,756; and same in first part of New Technical College, Berkeley Electrical Engineering Co., Ltd., £37,002.

**Lambeth B.C.** Supply of equipment for lighting pedestrian crossings, Revo Electric Co., Ltd., £1,544.

**Leicester.** Electrical work and installation of diesel generator at Carlton Hayes Hospital, Russell Newberry and Co. Ltd., £2,407; also installation of rectifier and switchboard at same, Kartret Switchgear Co., £1,944.

**Stourbridge T.C.** Provision of 32 street lamps and equipment for Wollaston Farm estate, Midlands Electricity Board, £1,058.

**Woolwich B.C.**—Electrical installation in 26 houses in Cantwell Rd., London Electricity Board, £1,374.

### PRICES OF CABLE METALS AND OTHER MATERIALS
*(at Tuesday night)*

| | £ s. d. | New York price |
|---|---|---|
| COPPER, electrolytic ... ... ... | 285 0 0 | — |
| LEAD, good soft pig (foreign) ... ... | 90 - 90½ | 108 0 0 |
| " " "English" quality ... | 91½ - 92 | |
| Tin (99·99·75%) ... ...(Cash) | 948-949 | — |
| " (3 months) ... ... ... ... | 940½-941 | — |
| ALUMINIUM, commercial purity (del.) | 166 0 0 | — |
| ZINC ... ... ... ... ... | 79 - 79½ | 88 0 0 |
| ARMOURING: | | |
| Galv. Steel Wire (·104 in.) ... | 51 10 0 | — |
| Mild Steel Tape (·04 in.) ... ... | 39 15 0 | — |

## TRADE MARKS

*This information is extracted from the Official Journal by permission of the Controller.*

**Dimex,** 713,915. **Rondite,** 713,916. **Rondex,** 713,917. Ceramic material for electrical insulation. George Wade and Son Ltd., Manchester Pottery, High St., Burslem, Stoke-on-Trent.

**Ella.** 709,123. Class 17. Insulators and insulating material. Lionel Robinson and Co. Ltd., 3 Staple Inn, W.C.1.

**Ionic.** B709,421. Class 11. Hand lamps, torches, miners' lamps and electric lamps. Ionic Alkaline Batteries Ltd., 66 Victoria St., S.W.1.

**Pifco.** 714,216. Class 7. Hair-drying machines. Pifco Ltd., Pifco House, Watling St., Manchester 4.

## TRADE NOTES

**Beama Contract Price Adjustment Formulae.** *For Electrical Machinery and Equipment.* For purposes of calculating variations in: (*a*) "Rates of Pay"—the rate of pay for adult male labour at March 14, 1953, shall be deemed to be 141s. 6d. (*b*) "Cost of Material"—the index figure for Materials used in the Electrical Machinery Industry, published in the Board of Trade Journal on March 14, 1953, is 161·3.

*For Turbo-Generating and Allied Plant.* For purposes of calculating variations in: (*a*) "Rates of Pay"—the rate of pay for adult male labour at March 14, 1953, shall be deemed to be 141s. 6d. (*b*) "Cost of Material—the index figures published in the Board of Trade Journal on March 14, 1953, are: Materials used in Mechanical Engineering Industries—148·1. "Blast Furnaces and Iron and Steel Melting and Rolling (40 and 41)"—142·5. The price of brass condenser tubes ¾ in. o/d. 18 SWG published in The Metal Bulletin on March 13, 1953, is 3s. 10½d. per lb.

*For Outstanding Contracts covered by the B.o.T. Intermediate products Index.* For purposes of calculating variations in: (*a*) "Rates of Pay"—the rate of pay for adult male labour at March 14, 1953, shall be deemed to be 141s. 6d. (*b*) "Cost of Material"—the index figure for Intermediate Products published in the Board of Trade Journal on March 14, 1953, is 345·4.

**Edinburgh Office.** The London Electric Wire Co. and Smiths, Ltd. and its associate companies—Frederick Smith and Co., the Liverpool Electric Cable Co. Ltd. and Vactite Wire Co. Ltd.—have opened a branch office and store at 7a Young Street, Edinburgh. Tel.: 26316.

**Change of Name.** The title of Electric Panels Ltd. has been changed to Panelec (Great Britain) Ltd.

## GAZETTE ANNOUNCEMENTS

### COMPANIES ACTS

**Electronic Manufacturing and Development Co. Ltd.,** Lincoln. Percy Cardwell of 93 Queen St., Sheffield, has been appointed liquidator.

**Anson Lee Ltd.,** London, E.C.2. Liquidator, H. F. Mathews, of 10 Coleman St., E.C.2, was released as from Feb. 20.

**L. Telling and Co. Ltd.,** St. Austell. J. W. Shaffery of 4 Tregarne Terrace, St. Austell, the liquidator, released as from Feb. 25.

**The Park Engineering Co. (Nottingham) Ltd.** Meetings of creditors and contributories will take place at Official Receiver's Office, 22 Regent St., Park Row, Nottingham, on March 24 at 2.30 p.m. and 3 p.m. resp.

**Bex Electric Ltd.,** London S.E.27. Last day for receiving proofs in respect of intended dividends, Mar. 28. Liquidator is R. Langdon Davis, Bedford Row House, 58 Theobalds Rd., London W.C.1.

**Fairclough (Leeds) Ltd.** Last day for receiving proofs in respect of intended dividends is Mar. 30. Liquidator is W. H. Meredith, Official Receiver, 29 East Parade, Leeds 1.

### BANKRUPTCY ACTS

*Dividends*

**Aylesbury.** Leonard G. Sharp, electrician, of 4 Summerley's Rd., Princes Risborough, Bucks. First and final dividends of 5s. 6d. in £ payable at 55 North St., Thame on Mar. 25.

*Intended Dividends*

**Bangor.** David L. Smith, electrical engineer trading at Midland Bank Chambers, Cefn Rd., Old Colwyn, Denbigh. Last day for receiving proofs, Mar. 30. R. P. Book, 5 Rumford Place, Liverpool 3, is liquidator.

# BUSINESS PROSPECTS

## HOME

**Aldershot T.C.** Erection of 132 flats on site adjoining Denmark Sq., Borough Engineer and Surveyor, Town Hall.

**Boreham Wood.** It is proposed to build secondary school at Leggatt's Farm and grammar school at Potters Lane costing £161,280 and £191,367.

**Boston T.C.** Erection of 24 houses on Woad Farm estate. Borough Engineer and Surveyor, Municipal Buildings.

**Brandon and Byshottles (Dur.) U.D.C.** Supply of materials to all trades for erection of 69 houses at Ushaw Moor. F. Hedley, architect and surveyor, Council Offices, Langley Moor, Durham.

**Breconshire.** Murphy Radio Ltd. propose alterations to premises on Hirwaun trading estate. D. M. Craig, of Wales and Monmouthshire Industrial Estate Ltd., is architect.

**Brigg U.D.C.** Construction of 56 houses on Woodbine estate. Buttrick and Buttrick, 43 Oswald Rd., Scunthorpe.

**Brighton T.C.** Secondary grammar school may be built at Withdean Stadium. Also erection of electrical workshop at Preston Technical Institute.

**Buckinghamshire.** Erection of secondary school at Bletchley. County Architect, County Offices, Walton St., Aylesbury.

**Chatham T.C.** Library is to be built in King George Rd.

**Darlington T.C.** Erection of 88, 22 and 10 houses on Firth Moor site. Borough Architect, Central Buildings.

**Doncaster.** Smiths (Mineral Waters) Ltd. have been allotted land for proposed new factory at Long Sandall.

**Dover.** A £20,000 factory is to be built by London Fancy Box Co. Ltd.

**Dunmow (Essex) R.D.C.** Plans approved for erection of 61 dwellings in Hatfield Heath housing scheme.

**Easington R.D.C.** Approval given to erection of 152 houses at Chapel Hill for Peterlee Development Corpn.

**Eastbourne.** Laboratory building is to be erected for Armour and Co. Ltd., London E.C.1, on Brampton Rd. trading estate.

**Eastbourne T.C.** Plans in hand for erection of 142 houses and 78 flats on Ocklynge Farm estate.

**Enniskillen T.C.** Erection of 29 houses in Derrychara Drive. N. J. Connor, Town Clerk, Town Hall.

**Halesowen T.C.** Erection of 34 dwellings on Howley Grange estate. J. C. T. Cole, Architect, Central Bldgs., Long Lane, Blackheath, nr. Birmingham.

**Hemel Hempstead.** Sketch plans approved for erection of infants' school in Chambersbury Lane, and secondary modern school at Bennetts End. Estimated costs are £52,368 and £212,400 respectively.

**Lanark.** Scottish Industrial Estates Ltd. have approved extensions to factory on Newhouse Industrial Estate for Euclid (Great Britain) Ltd. Architects are Wylie, Shanks and Wylie, 120 Blytheswood St., Glasgow.

**Liverpool.** Application will probably be made for sanction to borrow £55,800 for erection of Booker Ave. infants' school.

**Neston U.D.C.** Erection of 84 houses on Liverpool-Raby Rd. scheme. Quantity Surveyors, G. D. Walford and Partners, 20 Castle St., Liverpool.

**New Forest R.D.C.** Erection of 36 houses at Lyndhurst. Engineer and Surveyor, Council Offices.

**Newcastle-under-Lyme.** Additions at their Waterloo works are being planned by British Glues and Chemicals Ltd.

**Newcastle-on-Tyne.** Architect for Shaw Processes Ltd.'s new factory is C. Solomon, 30 St. Mary's Place, Newcastle.

**Paignton U.D.C.** Erection of 52 flats and 8 houses on Foxhole estate. S. Hodson, Clerk of Council, Municipal Offices, Oldway, Paignton.

**Plymouth.** Louis De Soissons, architects, 3 Park Sq. Mews, N.W.1, will probably be asked to prepare plans for erection of Whitleigh secondary modern school. Plans in hand for 178 houses at Penlee, 160 on Chaucer Way estate, 32 at Honicknowle and other smaller groups.

**Port Talbot.** Steel Co. of Wales propose large extensions to their local factory.

**Reading T.C.** Scheme in hand for erection of shops and dwellings on Bath Rd. estate.

**Rowley Regis T.C.** Erection of 32 flats on Throne Rd. estate. Borough Engineer and Surveyor, Municipal Bldgs., Old Hill, Staffs.

**Scarborough T.C.** Loan sanction received for £124,874 for erection of 96 houses on Eastfield estate.

**Scunthorpe T.C.** Over 200 dwellings to be built on Church Farm estate.

**Seaham U.D.C.** Construction of 102 houses on Westlea estate. A. M. Smith, Cliff House, is Council's Surveyor.

**Shrewsbury T.C.** Erection of blocks of shops and maisonettes on estates at Crowmoor, Springfield, Oakfield and Meadows. Borough Engineer and Surveyor, Guildhall.

**Southampton.** Erection of 73 maisonettes in three blocks at Itchen. Borough Engineer, Civic Centre.

**South Shields T.C.** Tenders to be invited for erection of 492 houses at West Simonside. Borough Engineer is J. Reid, Town Hall.

**Sunderland T.C.** Sanction received to borrow £487,738 for erection of 372 houses on Castletown estate.

**Tynemouth T.C.** Approval given for erection of factory in Walker Place for T. B. Bilton and Son.

**Tyrone.** Construction of two schools and other works on Coolnafrankie estate. A. Gibson, Chief Education Officer, Education Offices, Omagh.

**Watford.** It is proposed to build junior school at Woodside estimated to cost £65,889.

**West Hartlepool.** Next year's building programme includes rebuilding St. Joseph's R.C. school, phase one of Brierton secondary school, Brierton House primary school, and St. Teresa's R.C. school.

**West Sussex.** About £1 million will probably be spent in coming year on schools at Crawley. Programme includes £212,310 secondary modern and £194,630 secondary grammar schools in Ifield neighbourhood.

**Worsley.** Factory costing about £200,000 is proposed by British Oxygen Co. Ltd.

## OVERSEAS

**Portuguese W. Africa.** Merio Silva and Companhia Lda. (Casa Paris), Caixa Postal No. 227, Luanda, Angola, wish to obtain domestic electric washing machines from the U.K.

# MEETINGS TO NOTE

## THURSDAY, MAR. 19

I.E.E. (Irish Branch).—"110 kV Transmission Line Erection in Ireland." M. A. Healy and F. Neary. Trinity College, Dublin, 6 p.m.

I.E.E. (London Utilisation Section).—Discussion on "Economics in Wiring Practice." Forbes Jackson, A. V. Milton and P. McKearney. Savoy Place, W.C.2, 5.30 p.m.

I.E.S. (Glos. and Cheltenham Centre).—Film Show and annual meeting. G.E.C., St. Aldate St., Glos., 6.15 p.m.

ELECT. WHOLESALERS FED.—Annual dinner at Dorchester Hotel, Park Lane, W.1.

A.S.E.E. (Kent Branch).—"Induction Motors." C. Severs. Royal Star Hotel, Maidstone, 8 p.m.

## FRIDAY, MAR. 20

I.E.E. (N. Midland Centre).—Annual dinner-dance at Grand Hotel, Harrogate, 7 p.m.

I.E.E. (N. Staffs sub-centre).—Annual dinner at Crown Hotel, Stone.

E.P.E.A. (Southern Tech. Group).—"Combustion"—film and paper by G. H. Harford. University College, Southampton, 7 p.m.

BRITISH REFRIGERATION ASSOC.—Annual luncheon at Connaught Rooms, Gt. Queen St., W.C.2, 12.45 p.m.

INST. OF HEATING AND VENTILATING ENGRS. (E. Midlands Branch).—"The Heat Pump." P. E. Montague. Loughborough Technical College, 6.30 p.m.

## MONDAY, MAR. 23

I.E.E. (N.E. Centre).—"Post-Graduate Activities in Electrical Engineering." W. J. Gibbs, D. Edmundson, R. G. A. Dimmick and G. S. C. Lucas. Neville Hall, Westgate Rd., Newcastle, 6.15 p.m.

I.E.E. (S. Midland Radio Group) "Electronic Motor Control." S. H. Dale. James Watt Inst., Gt. Charles St., Birmingham, 6 p.m.

I.E.E. (Western Utilisation Group).—"Electricity in Farm Crop-Drying." C. A. Cameron Brown and P. G. Finn-Kelcey. Elect. House, Colston Ave., Bristol, 6 p.m.

I.E.E. (London Radio Section).—Debate: "That Broadcasting Hours should be Drastically Curtailed." Savoy Place, W.C.2, 5.30 p.m.

I.E.S. (Leicester Centre).—"Display Lighting for the Coronation." E. Mid. Board, Charles St., 6.30 p.m.

E.P.E.A. (London Tech. Group).—"275 kV Grid Development." Caxton Hall, Westminster, 7 p.m.

## TUESDAY, MAR. 24

I.E.E. (E. Midland Centre).—"Modern Problems in Field of Technical Education." D. S. Anderson. Gas Board Offices, Nottingham 6.30 p.m.

I.E.E. (N. Midland Centre).—Discussion on "Armature Windings." E. M. Price and W. Lindley. Badford Tech. College, Gt. Horton Rd., 6.30 p.m.

I.E.E. (N.W. Supply Group).—"Electrolytic Analogue in Design of h.v. Power Transformers." D. McDonald. Engrs. Club, Albert Sq., Manchester, 6.15 p.m.

I.E.S. (Liverpool Centre).—"Lighting in Shipyards." J. S. McCulloch. Elect Offices, Whitechapel, 6 p.m.

I.E.E. (Rugby sub-centre).—Annual meeting. Discussion on "Electric Traction." College of Technology and Arts, 6.30 p.m.

BRITISH INSTN. OF RADIO ENGRS. (W. Midland Section).—"Principles of Electronic Computing Machines." B. V. Bowden. Staffs. Tech. College, Wolverhampton, 7.15 p.m.

I.E.E. (Irish Branch).—Faraday Lecture: "Light from the Dark Ages, or Evolution of Electricity Supply." A. R. Cooper. Mansion House, Dublin, 8 p.m.

I.E.E. (S. Midland Centre).—"Development and Design of Electrical Control Gear for Machine Tools." A. R. H. Thorne. Works Inst., Hylton Rd. power station, Worcester, 7.15 p.m.

INST. OF FUEL.—"Experience with Spreader Stokers." T. H. Lindsay and P. Pilkington. Mechanical Engrs. Storey's Gate, S.W.1, 5.30 p.m.

A.S.E.E. (York Branch).—"Installation and Maintenance of Electric Motors." R. Spence. Creamery Restaurant, Pavement, 7.30 p.m.

## WEDNESDAY, MAR. 25

I.E.E. (N. Lancs sub-centre).—"Electricity in Farm Crop-Drying." C. A. Cameron Brown and P. G. Finn-Kelcey. N.W. Board, 45 Talbot Rd., Blackpool.

I.E.E. (S.E. Scotland sub-centre).—"Application of Transductors as Relays to Protective Gear." R. K. Edgley and F. L. Hamilton. Heriott-Watt College, Edinburgh, 7 p.m.

I.E.E. (Southern Centre) and INSTN. OF MECH. ENGRS. (Southern Branch).—"Aspects of Generating Station Construction." C. W. Priest. 46 Commercial Rd., Portsmouth, 6.30 p.m.

I.E.E. (Oxford).—"Nuclear Reactors and Applications." Sir John Cockroft.

I.E.E. (London Supply and Measurements Sections).—"Transformer—Analogue Network Analysers." M. W. Humphrey Davies and G. R. Slemon. Savoy Place, W.C.2, 5.30 p.m.

I.E.S. (London).—Series of short papers by student members. 2 Savoy Hill, W.C.2, 6 p.m.

## THURSDAY, MAR. 26

I.E.E. (London). — "Studies of Telephone Traffic with Aid of a Machine." S. W. Broadhurst and A. T. Harmston. Savoy Place, W.C.2 5.30 p.m.

I.E.S. (Bradford Group).—Fluorescent Forum at Y.E.B., 45-53 Sunbridge Rd., 7.30 p.m.

E.P.E.A. (S.W. Tech. Group).—Annual meeting and film show. Elect. House. Colston Ave., Bristol, 7.15 p.m.

## FRIDAY, MAR. 27

I.E.E. (London Educ. Circle).—Discussion on "Courses in Electrical Engineering in R.N." Capt. (L) L. S. Bennett, R.N. Savoy Place, W.C.2, 6 p.m.

## EXHIBITION DIARY

**Daily Mail Ideal Home.** Opened on Mar. 3 at Olympia, London, and continues until Mar. 28.

**Factory Equipment.** Opens on Mar. 23 at Royal Horticultural Society's New Hall, Westminster. Closes on Mar. 27.

**Electrical Engineers'** Second National Exhibition will open at Earls Court on Mar. 25, continuing until Mar. 28.

**Physical Society.** 37th Show at Imperial College, S. Kensington. Opens on April 13 and closes on April 17.

# NEW COMPANIES

*Extracted from the Register issued by Jordan and Sons, Ltd., 116 Chancery Lane, London W.C.2.*

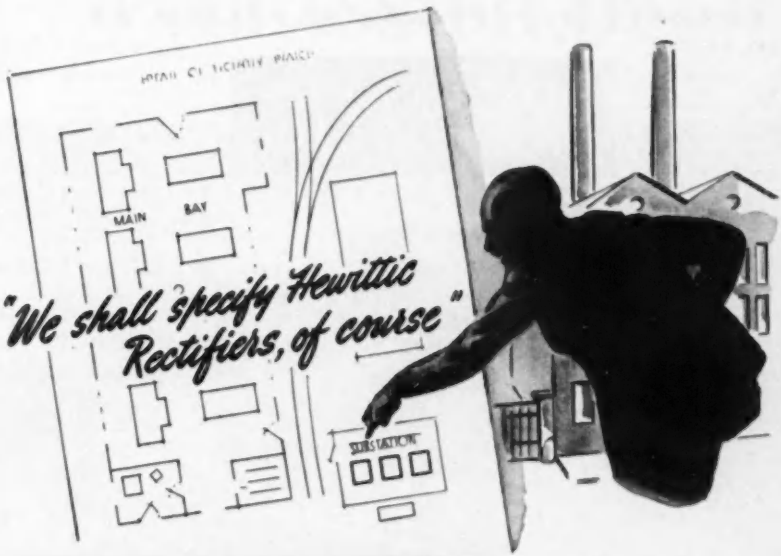
**Teddington Industrial Equipment Ltd.,** Windmill Rd., Sunbury-on-Thames, Middx. Manufacturers of and dealers in industrial and engineering controlling, indicating and recording apparatus and instruments, etc. Cap.: £100. Dirs.: to be appointed by subs.

**Ward's Refrigeration Ltd.,** Central Chambers, Bearwood Rd., Smethwick, 41. To take over business of refrigeration and electrical engineers and consultants carried on as "Ward's Refrigeration Service" at 82 Lakey Lane, Hall Green, Birmingham. Cap.: £1,000. Dirs.: W. H. S. Ward, and Edna M. Chatwin.

**J. R. Williams and Co. (Electrical Engineers) Ltd.,** 10, Paton St., Manchester. Cap.: £10,000. Dirs.: C. H. Hodgson, J. W. Blenkin and G. T. Pollock.

**Foster and Smith (London) Ltd.,** 349 Harrow Rd., W.9. Diesel, electrical and mechanical engineers, etc. Cap.: £100. Dirs.: F. J. D. Smith and G. Sargent.

**Power Connectors, Ltd.** Electric, mechanical and general engineers, etc. Cap.: £100. Dirs.: to be appointed by subs. Subs.: A. G. Crouch, 15 St. Stephens Av., Ashtead, Surrey, and L. R. Pepper, The Birch, St. Johns, Woking, Surrey.

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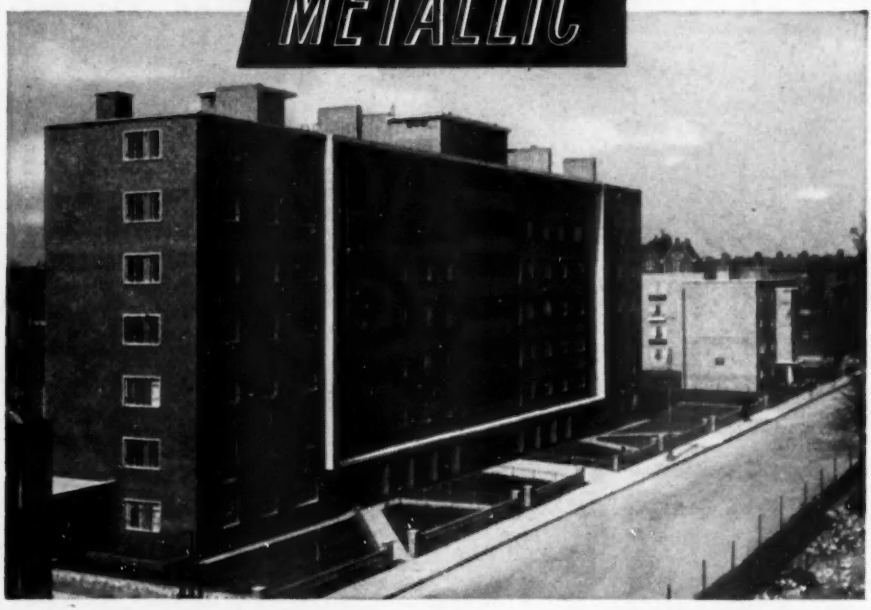

Godwin House, St. Marys Estate, Shoreditch.

*(With acknowledgement to Shoreditch Borough Council and Iverson Electrical, Ltd.)*

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It may be a school, it may be a factory—a power station or a housing estate, but more often than not the electrical specification will be—METALLIC.

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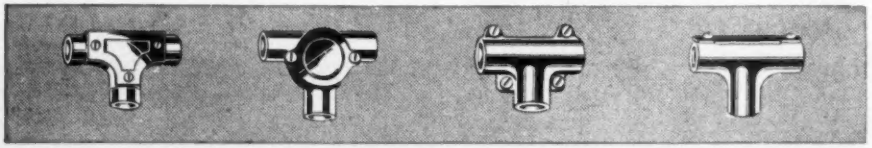

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# CLASSIFIED ADVERTISEMENTS

OFFICIAL TENDERS AND APPOINTMENTS

WORK WANTED WANTED · FOR SALE

**Those wishing to advertise in these pages should send the text to the Classified Advertisement Dept., Electrical Times, Sardinia House, Sardinia Street, London W.C.2, before 10 a.m. on TUESDAY of week of issue. Official Displayed Advertisements are charged at 42s. per inch, and all other classified advertisements at 3s. per line. Situations Wanted will be published four times for twice the single insertion rate. Fee for Box No. and postage on replies is 2s.**

## TENDERS INVITED

### CITY OF MANCHESTER

THE CLEANSING COMMITTEE invite tenders for ELECTRICAL INSTALLATION in waste utilisation plant at Grimshaw Lane Cleansing Depot, Newton Heath, Manchester. Specification and tender form may be obtained from the City Architect, Town Hall. Deposit £1 1s. (returnable). Tenders, sealed in endorsed envelopes, must be delivered before 10 a.m., April 8, 1953.

PHILIP B. DINGLE,
Town Clerk.

March, 1953. (D 205)

### BOROUGH OF SUTTON COLDFIELD

A452—CHESTER ROAD LIGHTING

TENDERS are invited for the SUPPLY and ERECTION of 63 Mercury DISCHARGE LAMPS on concrete columns and brackets (Group "A" Standard Lighting) on the above road.

Contract documents may be obtained from and plans inspected at the Borough Surveyor's Office. A deposit of £2 (two pounds) is required in respect of the documents, this being returnable on receipt of a bona fide tender not subsequently withdrawn.

Tenders, in plain sealed envelopes endorsed "Chester Road Lighting," should be delivered to the undersigned not later than noon on Friday, April 3, 1953.

R. WALSH,
Town Clerk.

Council Offices,
Sutton Coldfield.
March 10, 1953. (D 185)

### BOROUGH OF LOUTH

TENDERS FOR FLOODLIGHTING

ELECTRICAL CONTRACTORS are invited to submit details of schemes for floodlighting the Parish Church of St. James, Louth, at a cost not exceeding £450.

Details of schemes and tenders for carrying out the work should be submitted to the undersigned not later than April 6, 1953.

The Council do not bind themselves to accept the lowest or any tender.

JOHN T. CHENERY,
Town Clerk.

Town Hall,
Louth.
March 13, 1953. (D 186)

## APPOINTMENTS VACANT

*Engagement of persons must be made through a Local Labour Office or Scheduled Employment Agency, if the applicant is a man aged 18-64, or a woman aged 18-59; unless the person concerned is excepted or the employment is in a managerial or professional capacity, or is otherwise excepted from the provisions of the Notification of Vacancies Order, 1952.*

### BRITISH ELECTRICITY AUTHORITY

*North Western Division*

VACANCY No. 39/53. DEPUTY POWER STATION SUPERINTENDENT at Stuart Street Power Station, Manchester 11. Salary £1,035/£1,081 (H.3). Good technical education and wide experience of power plant essential. P.F. experience and appreciation of all aspects of power station administration desirable. Apply to Establishments Officer, British Electricity House, 825 Wilmslow Road, Manchester 20, before March 30. (D 131)

### BRITISH ELECTRICITY AUTHORITY

*South Western Division*

JUNIOR ENGINEER (CONTROL) required at Hayle Generating Station.

Superannuation Scheme. Salary, N.J.B. Class "F," Grade 15. Commencing at £390.

Applicants should possess O.N.C. in Electrical or Mechanical Engineering or equivalent. Previous generating station experience considered an advantage.

Application forms obtainable from the Divisional Secretary, 26 Oakfield Road, Bristol 8, to be returned not later than March 23, 1953. (D 165)

### NORTH WESTERN ELECTRICITY BOARD

APPOINTMENT OF DISTRICT SENIOR CLERK
Rochdale District

THE PERSON appointed will be responsible for the supervision and carrying out of all clerical functions in the District. Applicants should have had experience in meter reading, costing, invoices and stores, wages and conditions of service, correspondence and general office routine, and in dealing with consumers' enquiries, records and accounts.

Salary scale, £640 to £700 p.a. Grade 5. N.J.C. conditions.

Applications to Sub-Area Manager, No. 3 Sub-Area, The North Western Electricity Board, Union Street, Oldham, by March 28, 1953.

APPOINTMENT OF SECOND ASSISTANT DISTRICT COMMERCIAL ENGINEERS
Rossendale District

Duties will include control and supervision of industrial and domestic contract wiring, preparation of specifications and installations, repair and maintenance of appliances on consumers' premises. Preference given to applicants who are Associate Members of the I.E.E.

Salary scale, £649 to £681 p.a. Grade E.7. N.J.B. conditions.

APPOINTMENT OF SUB-AREA SENIOR DEMONSTRATOR
Blackburn Sub-Area

Applicants must have had a good education with training in domestic science and should hold the E.A.W. Diploma. The person appointed will be required to give lectures and demonstrations on all types of domestic appliances, advise consumers on the choice of equipment, and must be capable of supervising staff and arranging the training and electrical education of new entrants up to E.A.W. Diploma standard.

Salary scale, £520 to £580 p.a. Grade 3. N.J.C. conditions.

APPOINTMENT OF ASSISTANT (COMMERCIAL DEVELOPMENT)
Sub-Area Consumers' Engineer's Department, Blackburn

Applicants should have experience in some of the following:

Supervision of service centres;
Domestic and commercial load development;
Organisation of exhibitions and demonstrations;
Publicity, advertising and display;
Agricultural and horticultural applications.

Salary scale, £520 to £580 p.a. Grade 3. N.J.C. conditions.

Applications to Sub-Area Manager, No. 5 Sub-Area, The North Western Electricity Board, Jubilee Street, Blackburn, by March 28, 1953.

APPOINTMENT OF ASSISTANT (CONSUMERS' ACCOUNTS)
Accountancy Department, Barrow District

Applicants should have had wide accountancy experience.

Salary scale, £520 to £580 p.a. Grade 3. N.J.C. conditions.

Applications to Sub-Area Manager, No. 6 Sub-Area, The North Western Electricity Board, Castle Green, Kendal, by March 28, 1953. (D 187)

## BRITISH ELECTRICITY AUTHORITY

*Southern Division*

S/13.394

APPLICATIONS are invited for the following positions in the Construction Department:—

THIRD ASSISTANT ENGINEERS
(Mechanical or Civil)

Mechanical Engineering: Applicants should have had experience in the design or construction of mechanical plant required in large engineering projects. Experience of generating station plant will be an advantage.

Civil Engineering: The work will include aspects of the construction of generating stations and applicants should have had experience of this or similar large engineering works.

Junior engineers are also required for both the above sections.

Applicants for these positions should have had a sound technical education and training and should hold, or be obtaining, qualifications leading to corporate membership of an appropriate professional institution.

Salaries according to qualifications and experience:—Third Assistants, £649 to £835.

Junior Engineers, £390 to £556.

Special application forms are obtainable from P. D. A. Oliver, Esq., Divisional Secretary, British Electricity House, High Street, Portsmouth, and applicants should state for which position they wish to apply. The forms must be returned by April 1, 1953. (D 206)

## SOUTH EASTERN ELECTRICITY BOARD

FIRST ASSISTANT DISTRICT ENGINEER
Purley District

SALARY £740-£774 p.a., plus London Weighting under N.J.B. E.5. Superannuable. Applicants should be qualified engineers and experienced in the planning, construction, operation and maintenance of underground systems up to 11 kV. Experience on overhead lines and on 33 kV plant maintenance an advantage. Duties include standby.

Applications, giving two referees, on forms obtainable from J. McAlister, B.Sc., A.M.I.E.E., District Manager, SEEBoard, Electric House, High Street, Purley, to be returned by April 1, 1953.

SENIOR SHOWROOM ASSISTANT
Kingston Showroom

Salary £460 by £20 to £520 p.a., plus £30 p.a. London Weighting under N.J.C., Grade 2. Successful applicant will be in charge of the showroom and responsible to the District Commercial Engineer. Applicants should have experience in an electricity supply showroom and be capable of advising consumers on apparatus. Superannuable.

Applications on forms obtainable from D. C. Thomson, B.Sc., M.I.E.E., Kingston and District Manager, SEEBoard, 22 Claremont Road, Surbiton, Surrey, to be returned, giving names of two referees, by April 1, 1953

A. L. BURNELL,
Secretary.

March 13, 1953. (D 212)

## NEW ZEALAND GOVERNMENT RAILWAYS

APPLICATIONS are invited to fill vacancies for SIGNAL and ELECTRICAL ENGINEERS in the Government Railways Service in New Zealand.

Applicants, who should preferably have had experience in railways signalling and communications, and also general electrical engineering work, would require to become Corporate Members of the Institution of Electrical Engineers as soon as practicable after appointment, if not already members. They would also require to become registered in due course in New Zealand.

It is essential that the colour vision of all candidates should be normal.

Commencing salary: £650 (N.Z.) to £1,030 (N.Z.), according to qualifications and experience after graduation.

Further particulars, conditions of appointment and application forms may be obtained on request from:

The High Commissioner for New Zealand,
415 Strand, London, W.C.2,

mentioning this paper and quoting reference A.3/36/34.

The closing date for receiving completed applications is April 24, 1953. (D 218)

## NORTH EASTERN ELECTRICITY BOARD

*Tyne Sub-Area*

APPLICATIONS are invited for the appointment of DISTRICT COMMERCIAL ENGINEER at Tynemouth District.

Applicants should preferably be qualified engineers, and be widely experienced in all aspects of service to domestic, commercial and small industrial consumers. Salary, Schedule "A." Class "E," Grade 4, £803-£834. N.J.B. conditions of service.

Applications, stating age, qualifications and experience, should be forwarded to the Secretary (Establishments), the North Eastern Electricity Board, Carliol House, Newcastle-upon-Tyne, within ten days of the appearance of this advertisement. (D 217)

## BRITISH ELECTRICITY AUTHORITY

*Southern Division*

APPLICATIONS are invited for the following position at Earley Generating Station, Reading.

OPERATION SUPERINTENDENT
Class "G," Grade 6, £787 to £818)

Applicants must have had considerable experience of the operation of a modern generating station. The person appointed will be responsible for the efficiency of the generating station plant, the coaling programme and the operation of the coal and ash handling plant and disposal operations. Preference will be given to candidates who have experience in a station with high temperatures and pressures and pulverised fuel equipment.

Preference will be given to corporate members of one of the senior professional engineering institutions or candidates holding appropriate equivalent qualifications.

Special application forms obtainable from P. D. A. Oliver, Divisional Secretary, 111 High Street, Portsmouth, must be returned by April 1, 1953. (D 207)

## MERSEYSIDE AND NORTH WALES ELECTRICITY BOARD

THIRD ASSISTANT ENGINEER required in the Planning Section of the Chief Engineer's Department, Electricity House, Love Lane, Pall Mall, Liverpool 3, at a salary in accordance with Grade 5 of Schedule "C" of the N.J.B. Agreement, initially with a placing in Class "AX" within the range £649-£790 according to qualifications and experience, and subsequently according to the classification of the Area, at present Class "DX," £842-858. Appointment superannuable and subject to medical examination.

Applicants should have had a thorough technical training, possess qualifications to enable them to become Chartered Electrical Engineers, and have knowledge of the economic factors governing the design and planning of distribution networks.

Applications should be made on forms obtainable from the Establishments Officer at the above address. Quote reference: 122A. Closing date: March 31. (D 163)

## SOUTH WALES ELECTRICITY BOARD

REQUIRED, an ASSISTANT to District Commercial Manager, District 103 (Cardigan) in the Western Sub-Area.

Applicants must have had experience in the application of electricity to domestic and commercial premises and all general purposes.

Salary in accordance with Class "A," Grade 9 (£461-£473-£485) of N.J.B. Schedule.

Applications, stating age, present position and salary, qualifications and experience, and giving three referees, to be addressed to the Secretary to arrive by March 28, 1953.

D. G. DODDS,
Secretary.

St. Mellons,
Cardiff. (D 215)

## SOUTH WALES ELECTRICITY BOARD

REQUIRED, ASSISTANT ENGINEER (Sub-stations) in District 342 (Merthyr), Central Sub-Area.

Applicants should have experience of construction and maintenance work in all types of a.c. sub-stations up to 33 kV and should preferably also have experience in the operation and maintenance of rotary conversion plant.

Salary in accordance with Class "E," Grade 9 (£587-£583-£600) of N.J.B. Schedule.

Applications, stating age, present position and salary, qualifications and experience, and giving three referees, to be addressed to the Secretary to arrive by March 28, 1953.

D. G. DODDS,
Secretary.

St. Mellons,
Cardiff. (D 214)

## MERSEYSIDE AND NORTH WALES ELECTRICITY BOARD

APPLICATIONS are invited for the appointment of ASSISTANT COMMERCIAL OFFICER at Headquarters, Liverpool, at a provisional salary of £1,350 per annum (subject to such adjustment as may be agreed by the appropriate negotiating body).

Candidates should preferably be Corporate Members of the Institution of Electrical Engineers, or have a similar qualification.

The duties of the position require a sound knowledge of Commercial practice and active sales promotion in domestic, commercial and rural load development.

The appointment is superannuable and subject to medical examination.

Application forms obtainable from The Establishments Officer, Ref. 123A, Merseyside and North Wales Electricity Board, Love Lane, Liverpool 3, should be returned by March 31, 1953. (D 164)

## CROWN AGENTS FOR THE COLONIES

ELECTRICAL FITTER required by the Government of Tanganyika for the Public Works Department for one tour of two to three years in the first instance. Salary in scale £819 rising to £1,144 (including temporary allowance). Gratuity of £20 for each three months' service. Outfit allowance £30. Free passages. Liberal leave on full salary. Candidates between 28 and 40 years of age must have served a regular apprenticeship to electrical engineering and have had subsequent experience in the operation and maintenance of diesel power stations up to 1,000 kW capacity and of industrial electrical power installations.

Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience, and mentioning this paper to the Crown Agents for the Colonies, 4 Millbank, London, S.W.1, quoting on letter M.29688.B. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (D 160)

## BRITISH ELECTRICITY AUTHORITY

*South Wales Division*

Vacancy No. 19/53

APPLICATIONS invited for following superannuable N.J.B. appointments:—

1. FIRST ASSISTANT STATION CHEMIST, Newport Power Station F.9 (£907/£629 p.a.).

2. JUNIOR ENGINEER (Crack Detection), Generation (Operation) Dept., Div. H.Q. AX/CX, 9 (£390/£556 p.a.).

Applicants for (1) should hold H.N.C. (Chem.) or equivalent and have experience in water treatment, coal and oil testing and corrosion problems; for (2) H.N.C. or equivalent and preferably metallurgical experience; duties will include supersonic examination of boilers and turbines.

Application forms obtainable from Div. Secretary, British Electricity Authority, South Wales Division, Twyn-y-Fedwen Road, Gabalfa, Cardiff, should be returned by March 30, 1953. (D 190)

## SOUTH EAST ESSEX TECHNICAL COLLEGE AND SCHOOL OF ART

LONGBRIDGE ROAD, DAGENHAM

*Principal:* F. Heathcoat, M.Sc., Ph.D., F.R.I.C., F.I.M.

APPLICATIONS invited for post of HEAD OF ENGINEERING DEPARTMENT (Burnham Report, Grade III).

Salary: £1,190 by £25 to £1,340 (man), plus £36 or £48 London allowance.

Applicants should possess a good engineering degree and have had suitable industrial, teaching, and administrative experience. Further particulars and application form obtainable from the Chief Education Officer, County Offices, Chelmsford (stamped addressed foolscap envelope) and returnable by April 7. (D 209)

## CROWN AGENTS FOR THE COLONIES

STATION ENGINEERS, Electricity Department, required for the Gold Coast Local Civil Service for two tours of 18-24 months in the first instance. Commencing salary according to age and experience in the consolidated scale, £990 rising to £1,230 a year. Gratuity up to £37 10s. for each period of three months' service. Outfit allowance £60. Free passages. Liberal leave on full salary. Candidates must have served an electrical or mechanical engineering apprenticeship and have had practical experience of the construction and maintenance of overhead line distribution systems for h.t. and l.t. supply and the maintenance of electrical power plant.

Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience, and mentioning this paper, to the Crown Agents for the Colonies, 4 Millbank, London, S.W.1, quoting on letter M.29137B. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (D 219)

## SOUTHERN ELECTRICITY BOARD

INSTALLATION ENGINEER

ISLE OF WIGHT, District of No. 3 (Portsmouth) Sub-Area. Salary N.J.B. Class "E," Grade 7, Column 1 (£649 per annum). N.J.B. conditions of service.

Applicants should be qualified to accept responsibility for all installation and maintenance work in the district and branches and to collaborate with the Development Engineer and District Commercial Engineer in the preparation of estimates for contracting work, particularly those of an exceptional nature. The duties will also extend to the branches.

The successful candidate for the above appointment will be required to contribute to the B.E.A. and Area Boards' Superannuation Scheme, if eligible.

Applications on forms obtainable from the Sub-Area Secretary, Lower Drayton Lane, Cosham, Portsmouth, and returned to him in envelopes suitably endorsed not later than March 30, 1953. (D 222)

## MIDLANDS ELECTRICITY BOARD

APPLICATIONS are invited for the following superannuable posts:

ASSISTANT BUILDING SUPERINTENDENT
Birmingham and District Sub-Area (A)

An extensive experience is required in the supervision of all buildings, maintenance and constructional work principally associated with offices, showrooms, depots, sub-stations and steel transformer kiosks. A full apprenticeship should have been served in the building trade and a knowledge of labour conditions and prices of materials is essential. Salary £622-£716 per annum (N.J.B. Grade N.13).

DEMONSTRATOR (FEMALE)
Birmingham and District Sub-Area. (B)

Duties involve lecture demonstrations and advising consumers on the selection and use of electrical apparatus. A recognised diploma in domestic science and electrical housecraft desirable. Salary £380-£470 per annum (N.J.C. Grade 1). Applications in respect of post (A), stating age, experience, salary and present position, and post (B), stating age, education and qualifications, should be forwarded within fourteen days to Emil Braathen, Sub-Area Manager, Midlands Electricity Board, 14 Dale End, Birmingham.

JUNIOR ENGINEER
Shropshire and Herefordshire Sub-Area

Technical qualifications desirable. Salary £390 per annum (N.J.B. Class "G," Grade 16). Applications, stating age, experience and present position, should be forwarded within fourteen days to Mr. W. Winwood, Sub-Area Manager, Midlands Electricity Board, Spring Gardens, Ditherington, Shrewsbury.

A. STEPHENS,
Secretary.
(D 208)

## BRITISH ELECTRICITY AUTHORITY

*South Eastern Division*

Littlebrook Power Station (480 MW)

SHIFT CHARGE ENGINEER

APPLICANTS should preferably hold an engineering degree or be Corporate Members of the Institution of Electrical Engineers and/or Institution of Mechanical Engineers, and have had extensive experience in the operation of modern high pressure turbine and boiler plant and e.h.t. switchgear. Considerable experience in administration and in the control of labour essential. Preference will be given to those with p.f. experience. Assistance with housing accommodation may be possible for those living at present in rented property. Class "M," Grade 7, £1,035 6s. p.a.

Kingston "B" Power Station
JUNIOR ENGINEERS (EFFICIENCY)

Applicants, who should preferably possess the Higher National Certificate and have had either a good engineering experience in a manufacturer's works engaged on the manufacture of power station plant or experience in power station operation, will be required to assist in plant investigation, testing and the maintenance of records. Class "G," Grade 16/14, commencing at £415 p.a.

N.J.B. conditions of service for both positions. Salaries quoted include London allowance. Applications, giving details of education, present position, experience, etc., should be received by the Station Superintendent at either Littlebrook Power Station, near Dartford, Kent, or Kingston "B" Power Station, Downhall Road, Kingston-on-Thames, not later than March 30, 1953. (D 188)

## GOLD COAST LOCAL CIVIL SERVICE

ELECTRICAL ENGINEERS
Electricity Department (CDE.145/13/02), Gold Coast

VACANCIES exist for Electrical Engineers in the Local Civil Service of the Gold Coast. Appointments are on contract in the salary scale £1,130-£2,020 per annum, point of entry depending on professional experience and age. A gratuity of £37 10s. is payable for each completed three months' satisfactory service.

Free first-class passages are provided for the officer, his wife and up to three children under the age of 13.

Government quarters, if available, are provided at a rental of £60-£90 per annum. Leave is granted at the rate of seven days for each completed month of resident service after a tour of 18-24 months.

Candidates, who should be under 45, must have passed or be exempt from Sections A and B of the examination for Associate Membership of the Institution of Electrical Engineers; and they must also have had considerable experience in power generation, distribution and consumers' installations.

Apply in writing to the Director of Recruitment, Colonial Office, Great Smith Street, London, S.W.1, giving briefly age, qualifications and experience. Mention the reference number (CDE.145/13/02). (D 231)

## BRITISH ELECTRICITY AUTHORITY

*East Midlands Division*

APPLICATIONS are invited for the following positions within the Division:—

ASSISTANT SECTION ENGINEER
Coventry Section Office — Vacancy No. 31/53

Applicants should have received a first-class technical education and should be Corporate or Graduate members of the I.E.E. and must have had experience in the maintenance and operation of high-voltage overhead lines and outdoor transformer and switching stations. Experience of 132 kV equipment would be an advantage.

Commencing salary will be in accordance with Grade 6, Class "AX/DX," of Schedule C of the N.J.B. Agreement (£584 to £787 per annum) and will commence at a point commensurate with qualifications and experience.

SECTION ENGINEER
Drakelow — Vacancy No. 28/53

The successful applicant will be required to take charge of a new Section to be established at Drakelow, near Burton-on-Trent.

The section will contain extensive 275 kV and 132 kV equipment and the candidates must have had wide experience in the maintenance and operation of 132 kV lines and sub-stations in a Transmission Section.

Preference will be given to candidates who are Corporate Members of the Institution of Electrical Engineers or hold equivalent qualifications.

Salary will be in accordance with Grade 4, Class "AX/DX," of Schedule C of the N.J.B. Agreement (£763 to £976 per annum).

The closing date for these appointments will be March 23, 1953.

CIVIL ENGINEERING DRAUGHTSMEN
Construction Department, North Wilford
Vacancy No. 22/53

Candidates should have experience in design and detail of reinforced concrete structures, piled and slab foundations for heavy plant, culverts, cable subways, etc., for general building construction, drainage and sanitation schemes, associated with offices and administrative buildings.

The salary will be in accordance with Grade 5 (£567 to £671 per annum) or Grade 6 (£433 to £567 per annum) of Schedule D of the National Joint Board Agreement.

SHIFT CONTROL ENGINEER
Derby Power Station — Vacancy No. 32/53

Applicants should have had a sound training and practical experience in a modern Generating Station. The possession of a Higher National Certificate in Electrical Engineering, or its equivalent, would be advantageous.

The salary will be in accordance with Class "F," Grade 10, of Schedule A of the National Joint Board Agreement (£577 to £598 per annum).

MALE ASSISTANT, PURCHASING DEPARTMENT
Divisional Headquarters — Vacancy No. 29/53

The successful applicant will be responsible for obtaining supplies of stationery, paper, printing, cleaning materials, brushes, protective clothing, furniture and general stores. Actual experience in buying is essential, and knowledge of the order progressing and records systems applicable to a large undertaking is desirable.

The salary for this appointment will be in accordance with Grade 2 of the National Joint Council Agreement (£460 to £520 per annum).

THIRD ASSISTANT ENGINEERS (ELECTRICAL)
Generation Construction Department — Vacancy No. 33/53

Applicants should be fully conversant with contract procedure and have had a fundamental training in electrical engineering, including workshops, and should preferably have had experience in the manufacture, erection, maintenance and operation of switchgear transformers, electrical auxiliaries, main and multicore cablework, and lighting and heating installations for large power stations. Candidates should possess a university degree or equivalent qualification in electrical engineering.

The salary for the appointment will be within Schedule C, Class "AX/DX," Grade 5 (£649 to £858 per annum) of the National Joint Board Agreement.

Closing date for Vacancies 32/53, 29/53 and 33/53 will be March 30, 1953.

ASSISTANT ENGINEER (BOILER HOUSE)
Leicester Power Station — Vacancy No. 34/53

Candidates should possess technical qualifications, Ordinary National Certificate minimum, and previous experience in a power station will be an advantage.

Salary and conditions of service will be in accordance with the Class "H," Grade 13 (£523 to £542 per annum) of the N.J.B. Agreement.

ASSISTANT SHIFT CHARGE ENGINEER
Northampton Power Station — Vacancy No. 35/53

Applicant should possess the Higher National Certificate, or its equivalent, and have had experience in a responsible position in a modern power station.

The salary will be in accordance with Class "G," Grade 9 (£641 to £667 per annum) of the National Joint Board Agreement.

*(Continued in next column)*

*(Continued from previous column)*

JUNIOR ENGINEER (CONTROL ROOM)
Leicester Power Station — Vacancy No. 37/53

Applications are invited for the appointment of Junior Engineer (Control Room) at Leicester Power Station. Candidates should possess or be taking a course of study leading to technical qualifications. Previous experience an advantage.

Salary and conditions of service will be in accordance with the N.J.B. Agreement, Class "H," Grade 14 (£499 to £516 per annum).

Closing date for the three latter appointments will be April 1, 1953.

The above appointments will be pensionable within the provisions of the British Electricity Authority and Area Boards Superannuation Scheme.

Applications are to be submitted on the official form which may be obtained from the Divisional Establishments Officer, British Electricity House, Barker Gate, Nottingham, and should be returned to the undersigned by the date stated. Please quote vacancy number.

L. F. JEFFREY,
Divisional Controller.
(D 213)

## SOUTH EASTERN GAS BOARD

FOREMAN ELECTRICIAN, EAST GREENWICH
Metropolitan Division

APPLICANTS should possess Higher National Certificate in Electrical Engineering or similar qualification and should be experienced in the operation and maintenance of e.h.t. and l.t. distributing mechanism and switch gear, medium a.c./d.c. meters and the operation of gear turbo generating plant and mercury arc rectifiers. They should also be familiar with the installation of all types of lighting cables.

Salary within the range £575 to £655 per annum.

Applications in writing, quoting reference V19/300, and giving full details should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. McCRAE,
Personnel Manager.
Katharine Street, Croydon.
(D 211)

## BRITISH ELECTRICITY AUTHORITY

*Midlands Division*

APPLICATIONS are invited for the following positions in the Generation (Construction) Department at Wolverhampton:—

(a) SECOND ASSISTANT ENGINEER (Mechanical). Candidates should have had a recognised training in mechanical engineering, and should preferably be Corporate Members of the Institution of Mechanical Engineers. Experience should include a thorough knowledge of the design and installation of mechanical equipment for power stations and the preparation of specifications.

(b) THIRD ASSISTANT ENGINEER (Mechanical). Candidates should possess at least the Higher National Certificate in mechanical engineering, and duties will be similar to those required for (a).

National Joint Board service conditions, superannuable appointments, salaries within Schedule "C," (a) Grade 2, commencing in range £834 to £970 and ultimately rising to £1,053, and (b) Grade 5, commencing in range £649 to £790, and ultimately rising to £858.

Application forms available from the Establishments Officer, 53 Wake Green Road, Moseley, Birmingham 13, to be completed and returned by April 4, 1953. (D 162)

AN IMPORTANT firm of import/export merchants established in the Middle East require an ASSISTANT for the manager of the department handling the sales of radios, lamps, and electrical equipment generally. Some experience in a similar capacity and ability to handle the departmental correspondence essential. Technical knowledge an advantage. Three-year contract at outset, followed by five months' leave on full pay. Board and quarters provided.—Write, with full particulars, to Box No. 2499, Electrical Times.
(D 192)

APPLICATIONS are invited for the following vacancy at Poole Generating Station, Dorset:—MAINTENANCE ENGINEER (MECHANICAL). Applicants should have a wide experience in the maintenance of modern generating station power plant and be capable of taking control of a large maintenance staff, machine shop, and supervising turbine and boiler overhauls.

Applicants should preferably be Corporate Members of the Institution of Electrical or Mechanical Engineers, or have equivalent qualification. Salary N.J.B. H/7, £772 to £902.

Special application forms, obtainable from P. D. A. Oliver, Divisional Secretary, British Electricity House, High Street, Portsmouth, must be returned by March 27, 1953. (D 167)

**BOX No. replies to be addressed to the ELECTRICAL TIMES, Sardinia House, Sardinia Street, London W.C.2**

## BRITISH ELECTRICITY AUTHORITY

*London Division*

APPLICATIONS are invited for the following superannuable posts. Salary, including London Allowance, and conditions of service in accordance with N.J.B. Agreement, Schedule A or C.

ASSISTANT SHIFT CHARGE ENGINEERS
Brunswick Wharf Generating Station

Qualifications: sound practical and technical training in electrical and mechanical engineering with practical experience in the efficient operation of power station plant. Salary: Class "H," Grade 9, £714 p.a.

EFFICIENCY AND OPERATION ENGINEER
Bankside Generating Station

Applicants must have had a sound technical and practical training experience in the operation of large high-pressure turbine and boiler units. Will be responsible for the efficiency of such plant and the control of personnel. Technical qualifications of not less than Higher National Certificate standard is desirable. Salary, N.J.B. Class "H," Grade 5, £929/5/- p.a.

ASSISTANT SHIFT CHARGE ENGINEER
West Ham Generating Station

Qualifications: sound practical and technical training in electrical and mechanical engineering with practical experience in the efficient operation of power station plant. Will be expected to carry out duties in control room and boiler house as required. Salary, N.J.B. Class "H," Grade 9, £714 p.a.

SHIFT CHARGE ENGINEER
St. Pancras Generating Station

Qualifications: sound practical and technical training in electrical and mechanical engineering with experience in efficient operation of medium pressure turbine and boiler plant, also E.H.T. switchgear. Character and ability to supervise all grades essential. Salary, N.J.B. Class "E," Grade 7, £681/9/- p.a.

SHIFT CHARGE ENGINEER
Walthamstow Generating Station

Qualifications: sound practical and technical training in electrical and mechanical engineering with experience of efficient operation of power station plant. Character and ability to supervise all grades essential. Salary, N.J.B. Class "D," Grade 7, £664/13/- p.a.

ASSISTANT SHIFT CHARGE ENGINEER
Islington Generating Station

Qualifications: sound practical and technical training with experience of efficient operation of power station plant. Salary, Class "D," Grade 9, £589/1/- p.a.

ASSISTANT ENGINEER
Barking "A" and "B" Generating Stations

Qualifications: sound technical education with either Ordinary or Higher National Certificate in electrics[1] or mechanical engineering. Experience in operation of E.H.T. switchgear, station auxiliaries and the control of large turbo-alternators an advantage. The duties of the successful applicant will be those of Second Assistant to the Station Shift Control Engineer in charge of the control room. Salary, N.J.B. Class "M," Grade 14, £655/4/- p.a.

ASSISTANT ENGINEER (MECHANICAL MAINTENANCE)
Bankside Generating Station

Applicants must have received a practical training in maintenance of modern large capacity boilers, turbines and auxiliary gear. Technical qualifications must be equivalent to Ordinary National Certificate standard. Salary, N.J.B. Class "H," Grade 10, £673/1/- p.a.

ASSISTANT MAINTENANCE ENGINEER (ELECTRICAL)
Bankside Generating Station

Applicants must have received a practical training in maintenance of modern large capacity electrical equipment, including h.t. switchgear, motors and starters. Technical qualifications must be equivalent to Ordinary National Certificate standard. Salary, N.J.B. Class "H," Grade 8, £752/17/- p.a.

GENERAL ASSISTANT ENGINEER
(Efficienty and Testing)—Divisional H.Q.

Qualifications: good technical education to Higher National Certificate standard and experience in the testing of steam turbo-generators and boilers and other power station plant. The commencing salary will be according to merit and ability in Class "AX," Grade 8, within scale £526/1/- to £670/19/-, ultimately rising to £749/14/- p.a. (Class "EX.").

Applications may be made on form obtainable from Divisional Secretary, B.E.A., London Division, Generation House, Great Portland Street, W.1, and be returned within 14 days of this advertisement. (D 221)

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BRITISH STANDARDS INSTITUTION requires a young ELECTRICAL ENGINEER for work in connection with the approval of all types of electrical equipment for export to Canada. Applicants should have served an apprenticeship and have H.N.C. as a minimum qualification. The position is pensionable and salary will be about £600 in accordance with qualifications and experience.—Apply Establishment Officer, B.S.I., 24 Victoria Street, S.W.1. (D 170)

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## SOUTH AFRICA

### A Technical Switchgear Sales Engineer

with experience in Tendering, Estimating and Sales Works required by our South African branch. Salary according to qualifications and experience. Good pension and life assurance schemes, permanent situation. Apply, stating age, experience and salary required to the

**Employment & Welfare Manager**
**JOHNSON AND PHILLIPS LIMITED**
**Charlton, London, S.E.7**

(D 90p)

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APPLICATIONS are invited for the following position: THIRD ASSISTANT ENGINEER (ELECTRICAL), Construction Department. Applicants should be in possession of technical qualifications admitting to corporate membership of a recognised professional institution, preferably have had experience in a manufacturer's works, and possess some knowledge of the layout of large switchgear or cabling installations. Salary N.J.B. AX/CX 5 £649 to £835.

Special application forms, obtainable from P. D. A. Oliver, Divisional Secretary, British Electricity House, High Street, Portsmouth, must be returned by March 27, 1953. (D 166)

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APPLICATIONS are invited for the post of DEPUTY MANAGER or EXECUTIVE ENGINEER (Steam) with the Karachi Electric Supply Corporation, Pakistan. The appointment will be on agreement for a period of three years, subject to three months' notice on either side. The salary will be between 2,000 and 2,500 Pakistan Rupees per month, according to qualifications and experience. (At present £1 equals about Rs 9/-). First-class passages will be paid between the U.K. and Karachi for the officer, his wife and up to three children, at commencement and termination of agreement period. Applicants must have had extensive experience in the installation, operation and maintenance of steam power station plant. Preference will be given to applicants who have had additional experience in one or more of the following fields—oil-fired boilers, composite geared turbo-alternator sets, 11 kV switchgear and transmission lines, statistical economics of generation and distribution, general administration of power supply organisation. The status of the appointment will depend on the extent of such additional experience.—Applicants must state age, qualifications, experience, minimum salary required and names of three independent referees. Box No. 2485, Electrical Times. (D 168)

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BRITISH ELECTRICITY AUTHORITY, Headquarters, require ASSISTANTS to the Regional Safety Officers in London and Bristol respectively. Candidates should have good engineering qualifications, a knowledge of the Factories Acts and safety regulations and preferably some experience in accident prevention in the supply industry. Duties will be to assist the Regional Safety Officers in such matters as making recommendations for safety measures and reporting on accidents. Salary N.J.B. 2nd Assistant Engineer, Grade 3, £800-£1,159 for Bristol: £840-£1,209 for London.

Applications to D. Moffat, Director of Establishments, Winsley Street, London, W.1, not later than April 7, 1953. Quote reference AE/350. (D 224)

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BRITISH ELECTRICITY AUTHORITY (London Division) require a GENERATION ENGINEER (OPERATION). Candidates should possess sound technical qualifications and be familiar with the operation of modern H.P. Plant. Administrative experience is essential and the successful candidate will be required to take full charge of a group of stations of an aggregate capacity of 718 MW. The salary will be within the provisional salary range, £1,325 to £1,800 per annum.

Applications stating age, present position and salary and giving full details of qualifications and experience should be forwarded to D. Moffat, Director of Establishments, British Electricity Authority, Winsley Street, London, W.1 by April 6, 1953. Quote reference AE/347. (D 169)

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DRAUGHTSMEN required for low tension small switch and fuse gear.—Write, giving age, details of experience and salary expected, to the Personnel Officer, W. T. Henley's Telegraph Works Co., Ltd., Gravesend, Kent. (D 193)

## JOHNSON & PHILLIPS, LIMITED
### CHARLTON, S.E.7

MANAGER OF SWITCHGEAR DEPARTMENT

APPLICATIONS are invited from well qualified Engineers with considerable experience in the switchgear industry for the appointment of Manager, Switchgear Department.

The successful applicant will be required to take full responsibility for design, development, production and the commercial conduct of this increasingly important section of the Company's activities. He will also be required to exercise overall technical control of the activities of the Company's switchgear factories overseas.

Applications, which will be treated in strict confidence, should be addressed to:—

**The Managing Director,**
**JOHNSON & PHILLIPS, LIMITED,**
**CHARLTON, LONDON, S.E.7.** (D 70p)

DESIGNER who has had experience with the actual design and manufacture of contactors, required by old-established firm of switchgear manufacturers. He must be capable of taking charge of a progressive new development on own initiative, in North West.—Box No. 2475, Electrical Times. (D 136)

DISTRIBUTION CONTROLLER required by the Steel Company of Wales, Ltd., Port Talbot, for shift duties in Control Rooms. Applicants should have had previous experience in the operation of high voltage distribution systems, and should have a sound technical knowledge. Persons with limited experience but good technical qualifications will be considered.

Applications in own handwriting, giving age, qualifications, experience, etc., should be addressed to the Personnel Superintendent, The Steel Company of Wales, Ltd., G.P.O. Box No. 3, Port Talbot. (D 149)

DRAUGHTSMEN. The English Electric Company, Limited, have vacancies at the Liverpool works for Electro/Mechanical Draughtsmen for interesting work on a wide variety of new projects. The essential requirements are previous experience as a draughtsman, on the design and detail of any kind of electro-mechanical equipment, mechanisms, or welded fabrications for batch production. Modern houses are available for selected applicants and travelling expenses for interviews will be paid.—Write, giving full details of age, qualifications and experience, to Central Personnel Services, Marconi House, 336-7 Strand, London W.C.2, quoting ref. 1099. (D 53)

ELECTRICAL DRAUGHTSMAN required for large paper mill by Bowater's Thames Paper Mills, Ltd., at Northfleet, Gravesend, Kent. Must be experienced in layout of power installations, wiring diagrams and switchgear. Some mechanical experience an advantage.—Please state age, experience and qualifications. (D 150)

ELECTRICAL ENGINEER, graduate preferred but H.N.C. would be considered. Age below 30, to take charge of electrical test work in laboratory engaged in the development and testing of specialised synthetic resin laminated for the electrical and radio industries. Some experience in similar work essential. Opportunities may arise for original work. N.W. Area.—State age and give full details of experience. Box No. 2467, Electrical Times. (D 171)

ELECTRICIAN wanted for gold mine in Tanganyika. Fully indentured apprenticeship, experience in heavy industrial electrical plant installation and maintenance essential. Knowledge of mining electrical plant an advantage. Salary £90 per month, 30 months contract, satisfactory man may be re-engaged on pensionable basis after first contract. Free living accommodation, passages out and home with generous leave provisions. Good climate.—Write, giving full particulars and copies of testimonials, to Box "K.B." c/o J. W. Vickers and Co. Ltd., 7/8 Great Winchester Street, London, E.C.2. (D 172)

EXPERIENCED STOREKEEPER required for Luton branch E.W.F. electrical wholesalers.—Young and Wildsmith, Ltd., 13 Collingdon Street, Luton, Beds. (D 55)

FOREMAN COIL-WINDER, experience of Douglas and Leesona automatics necessary. 5-day week. South London. Good wages, perm. progressive position.—Apply Box No. 2497, Electrical Times. (D 191)

GENERAL TRANSFORMER CO., 167 St. Georges Way, Camberwell, London, S.E.15, require assembly shop FOREMAN with experience in mass production of small high voltage transformers.—Apply by letter only, giving full details of experience and wages required. (D 173)

IMPERIAL CHEMICAL INDUSTRIES, LIMITED, General Chemicals Division, invite applications for the position of ASSISTANT SHIFT CHARGE ENGINEER in the Company's Power Department for duty in their Weston Point Power Station, Runcorn, which has an installed capacity of 100 MW. Applicants, who should be between the ages of 25 and 30 years, should have had a sound practical training in mechanical engineering, hold the Higher National Certificate in Mechanical Engineering or equivalent qualification and should have had some experience of the operation of large modern water tube boilers, turbo-alternators and ancillary plant. The commencing salary will not be less than the up-to-date figure payable under the N.J.B. Schedule "A" for Class "G," Grade 9, while the maximum salary will be considerably higher than that for the same class and grade. The selected candidate will be required to pass a medical examination and to join the Company's Pension Fund. —Applications in writing, giving age and full particulars of education, technical qualifications, engineering training and power station experience, should be sent to the Staff Manager, Imperial Chemical Industries, Limited, General Chemicals Division, Cunard Building, Liverpool, 3, quoting reference P/5. (D 115)

INDIA—ELECTRICAL ENGINEER required under contract by London firm of consulting engineers to supervise contractors on the installation of all electrical equipment required for extensions to an iron and steel plant in India. Experience in installation of motors up to 500 h.p., switchgear, transformers and cables up to 11 kV essential.—Apply, in the first instance, with details of education and experience, to Box No. 2501, Electrical Times. (D 195)

LIVE AGENTS required throughout U.K. to sell Top Grade Pressure Cookers and Ground Based Holloware. Generous commission and guaranteed areas. Only men with proved selling capabilities need apply.—Box No. 2489, Electrical Times. (D 174)

MANUFACTURER of industrial lighting fittings requires experienced REPRESENTATIVE calling on wholesalers in North Britain.—Box No. 2477, Electrical Times. (D 137)

NATIONAL COAL BOARD invite applications for superannuable appointments as SCIENTIST, Grade II (salary scale £645 by £30 to £1,095, plus London Location Allowance) at the Central Research Establishment II, Worton Road, Isleworth, Middlesex.

Candidates should have a good honours degree (or equivalent) and at least three years post-graduate research experience in one or more of the following fields: tele-communications, automatic control, electromagnetic theory.

Write, giving full particulars (in chronological order) of age, education, qualifications and experience (with dates) to National Coal Board, Establishments (Personnel), Hobart House, Grosvenor Place, London, S.W.1, marking envelope TT/608. Original testimonials should NOT be forwarded. Closing date, April 25, 1953. (D 225)

PROFESSIONAL ENGINEERS IN VARIOUS GOVERNMENT DEPARTMENTS. The Civil Service Commissioners invite applications for about 150 pensionable posts in a wide variety of engineering duties. Applications may be accepted up to September 30, 1953, but an earlier closing date may be announced.

Candidates must be under 35 on January 1, 1953, with extension for regular service in H.M. Forces and up to two years for permanent civil service. For the Post Office they must be at least 21, for the Ministry of Supply and Ministry of Civil Aviation at least 23, and for all other Departments at least 25 on that date.

Generally, a candidate must possess a university degree in engineering or be a Corporate Member of one of the professional institutions—Mechanical Engineers, Electrical Engineers, or Civil Engineers, or have passes in, or exemption from, Sections A and B of the corresponding Associate Membership examinations. Exceptionally, candidates of high professional attainment but without the specified qualifications may be admitted. For some posts Associate Fellowship of the Royal Aeronautical Society or an honours degree in Physics will be accepted.

Inclusive salary scale (men in London), £628 (at age 25) to £970. Starting salary according to age up to £875 at 34. Candidates entering below age 25 will start at salaries varying from £429 at age 21 to £549 at age 24. Prospects of promotion. Salaries of next higher grades are £970-£1,280 and £1,331-£1,536. Somewhat lower for women and in the provinces.

Further particulars and application forms from Civil Service Commission, Scientific Branch, Trinidad House, Old Burlington Street, London W.1, quoting No. S385/53. (D 196)

*Engagement of persons must be made through a Local Labour Office or Scheduled Employment Agency, if the applicant is a man aged 18-64, or a woman aged 18-59; unless the person concerned is excepted or the employment is in a managerial or professional capacity, or is otherwise excepted from the provisions of the Notification of Vacancies Order, 1952.*

OLD ESTABLISHED electrical contractors in London require SENIOR EXECUTIVE with a view to expansion of business. Good salary and prospects for man with right experience and connections. Applications treated as confidential.—Box No. 2491, Electrical Times. (D 175)

PROFESSIONAL ASSISTANCE required for preparation of a course of lessons in refrigeration.—Apply, giving full details of qualifications and experience, to Box No. 2505, Electrical Times. (D 226)

REPRESENTATIVE for Midland area. Connection with Electrical Contractors and Industrial Users an advantage. Salary and commission.—Reply stating experience, age and remuneration required. General Manager, Drake and Gorham Wholesale Ltd., 77 Long Acre, London, W.C.2. (D 176)

REPRESENTATIVES already calling on Electrical and Radio Retail Trade, and who are looking for an additional line to augment their income, are invited to apply for further particulars. This line carries generous commission, can be slipped into the wallet, and sells all the year round.—Please write Box No. 2493, Electrical Times. (D 177)

REPRESENTATIVES required, motor and control gear, London, Manchester and Glasgow areas.—Apply in writing, Sales Director, Veritys Ltd., Brettenham House, Strand, W.C.2. (D 117)

SALES AND TECHNICAL MANAGER required to develop well-established armature winding and motor repair shop in Central London.—Write, giving details of age, qualifications and experience, to Box No. 2507, Electrical Times. (D 227)

SALES ENGINEER required by old established British firm in East Africa. Salary from £50 to £60 per month, according to qualifications and experience. First tour of three years followed by six months leave on full pay. Permanent post for good man. Free quarters, medical attention and passages out and home. Single man preferred, age limits 26 to 32. Must have good education, technical training and some electrical sales experience preferable, cables, small switchgear, motors and electrical appliances. Progressive post for young man showing diligence and capability.—Replies to Box No. 2495, Electrical Times. (D 178)

SENIOR DESIGN ENGINEER required by well-known manufacturers of Rotating Dynamo Electric Machinery. This is a senior Staff Position, and salary will be commensurate with the candidate's qualifications and experience, and will be not less than £900 per annum, as well as staff superannuation.—Reply to Box B.1149, W. H. Smith and Son Ltd., Manchester 3. (D 179)

TAYLOR, TUNNICLIFF AND CO., LTD., require the services of an ELECTRICAL ENGINEER, preferably under 30 years of age, holding a B.Sc. degree in electrical engineering or physics, or equivalent qualification. Applicants should have served an apprenticeship in an electrical or mechanical engineering works. The duties will consist of testing, development and research in connection with high voltage porcelain insulators.—Application, stating age, qualifications, experience and salary required, to be submitted in writing to:

The Managing Director,
Taylor, Tunnicliff and Co., Ltd.,
Eastwood, Hanley, Staffs. (D 228)

TRANSFORMERS (WATFORD) LTD. require a CHIEF ASSISTANT DRAUGHTSMAN for transformers up to 10,000 kVA. A sound and progressive staff appointment carrying salary commensurate with experience. Housing assistance provided if necessary.—Apply in confidence, Managing Director, Transformers (Watford), Ltd., Sandown Road, Watford, Herts. (D 119)

WELL-KNOWN electric cooker manufacturers require a WOMAN DEMONSTRATOR. Age between 30 and 35 with experience to cover the north of England, including Yorkshire and preferably one born in or residing for many years in the latter county.—Apply with full particulars to Box No. 2481, Electrical Times. (D 152)

## APPOINTMENTS WANTED

POSITION desired as SALES MANAGER or LONDON AREA MANAGER. 25 years in electrical industry. Rotating plant of all types with associated electrical equipment. Detailed experience of industrial applications, special drives, private generation, control and switchgear, installation, welding plant, etc. Apprenticeship and training with leading manufacturing company. Twelve years' experience as area manager.—Box No. 2503, Electrical Times. (D 197)

## WANTED

**REQUIRED**
Second-hand Ballinger "C" Type
**ABRASIVE CUTTING-OFF MACHINE**
suitable for cutting angle 3 x 3 x ½ in.
**COLVIN-SMITH, LTD.**
**Fourth Avenue,**
**Team Valley, Gateshead-on-Tyne**
(D 138p)

A.C.-D.C. MOTORS, STARTERS, complete change-over installations, etc.—A.A. Electrical Co., Ltd., 67 Rothschild Road, Chiswick Park, W.4. Tel.: Chiswick 5105. (D 9)

ADVERTISER requires regular supplies secondhand upright VACUUM CLEANERS.—Box No. 2439, Electrical Times. (D 39)

SECONDHAND, Two G.E.C. 2 or 3 kW FAN HEATERS.—Lethbridge, Wood, South Tawton, Okehampton. (D 229)

WANTED, D.C. and A.C. ball-bearing MOTORS, MOTOR GENERATOR SETS, DYNAMOS and ALTERNATORS.—Full details to Britannia Manufacturing Co., Ltd., 22-26 Britannia Walk, London N.1. (D 5)

WANTED for prompt cash, ferrous and non-ferrous SCRAP; also plant for dismantling. Buyers of secondhand machinery and plant for re-use.—W. and H. Cooper, Ltd., 176 Brady Street, Bethnal Green, E.1. (D 1).

WANTED, Large quantity of 4-in. outside diameter TUBES from the dismantling of old Babcock water tube boilers. Best prices paid. Prepared to purchase Babcock and Wilcox water tube boilers for dismantling. Apply, giving full details to Midland Iron and Hardware Co., Cradley Heath, Staffs. (D 2)

WANTED, ROTARY CONVERTERS, any size.—Universal, 221 City Road, London E.C.1. (D 7)

500 or 1,000 volts BRIDGE MEGGER. New or secondhand.—The Lewis Electric Company, Blackamoor Lane, Maidenhead. (D 180)

## WORK WANTED

A.C. and d.c. MOTOR REWINDS and REPAIRS. Prompt service fully guaranteed. Edgware 5566 (4 lines).—Service Electric Co., Ltd., Stanmore, Middx. (D 15)

ARMATURE REWINDING SERVICE to the Trade. Vacuums, Drills, Grinders, Hood Dryers, Dental Motors, Vacuum Cleaner and Drill Armatures replaced from stock. 24-hour service. Every job guaranteed. All vacuum cleaner parts, hoses, etc., in stock for any make.—Regam Electric Cleaner Service, 96-97 Park Lane, Leeds 1. (D 31)

FISHER FOUNDRIES, LTD., Greet, Birmingham, have immediate capacity for machine moulded PRECISION CASTINGS in gunmetal and grey iron, ¼ to 30 lb. All castings shot blasted.—Telephone: Birmingham, Victoria 0197. (D 21)

WORK WANTED. Capacity available for all types of COIL WINDING.—Box No. 2425, Electrical Times. (D 36)

## AGENCIES

COMMISSION AGENTS wanted, calling on wholesalers. Eastern and southern areas available. Wrought iron lighting fittings, health lamps, ships' fittings, conduit fittings. Please give full information in confidence, and state area covered.—Box No. 2401, Electrical Times. (D 29)

## BUSINESS OPPORTUNITIES

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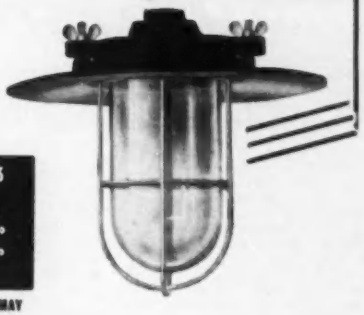

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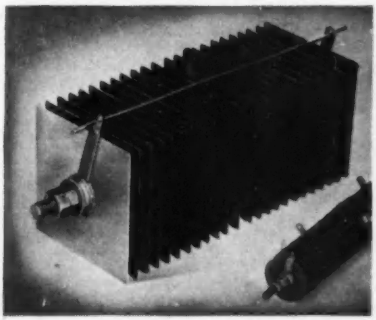

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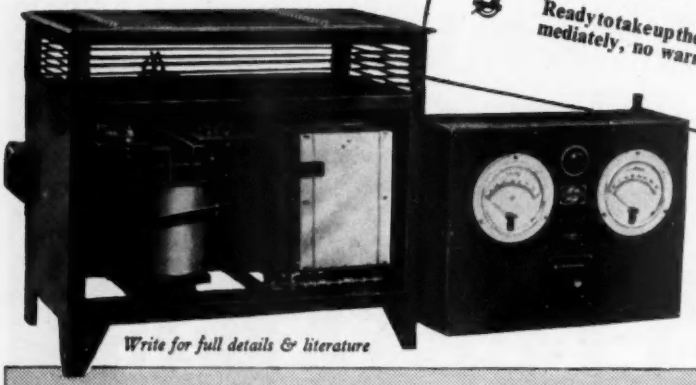

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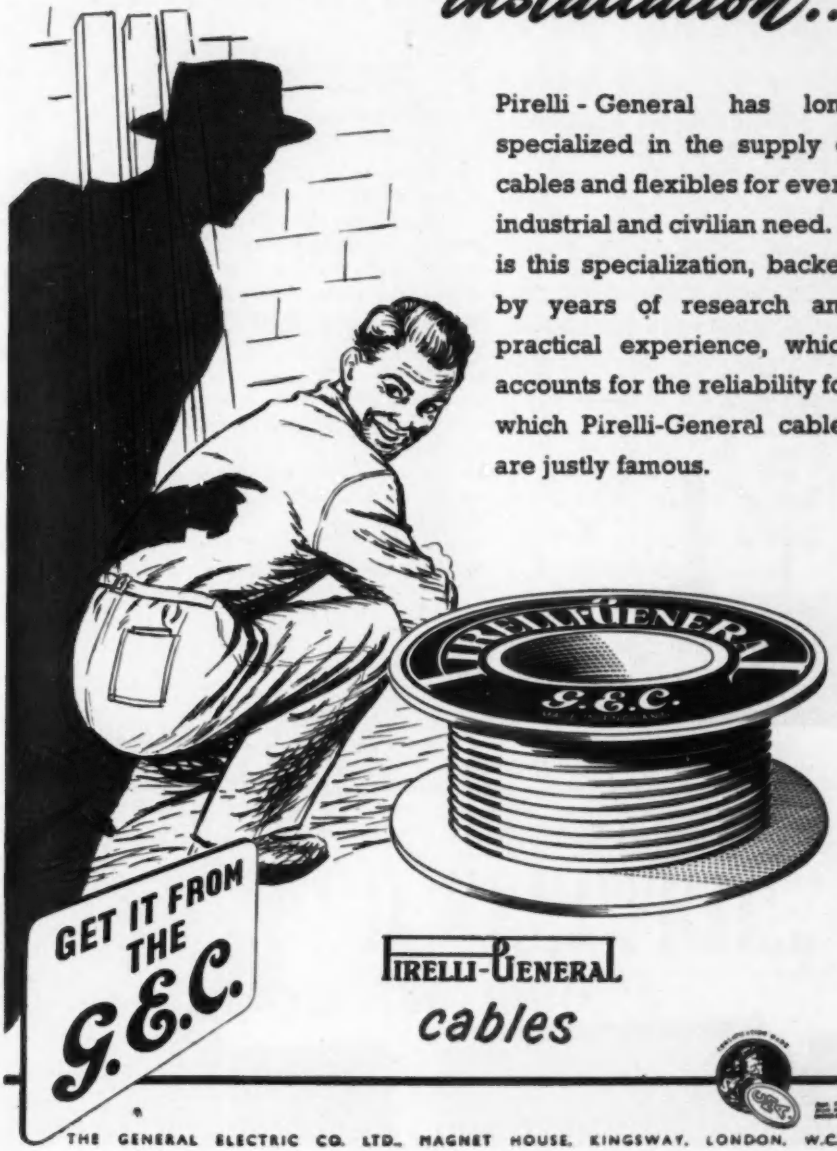


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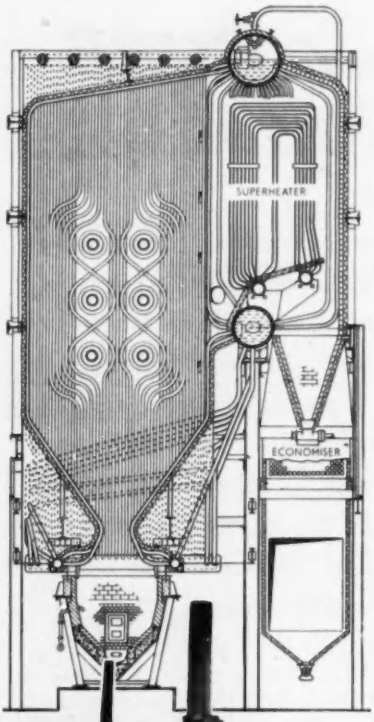


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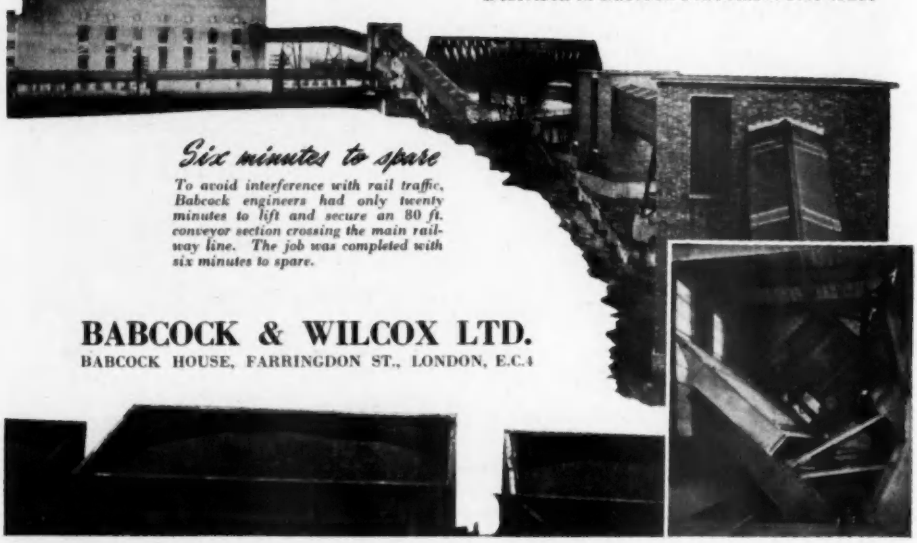

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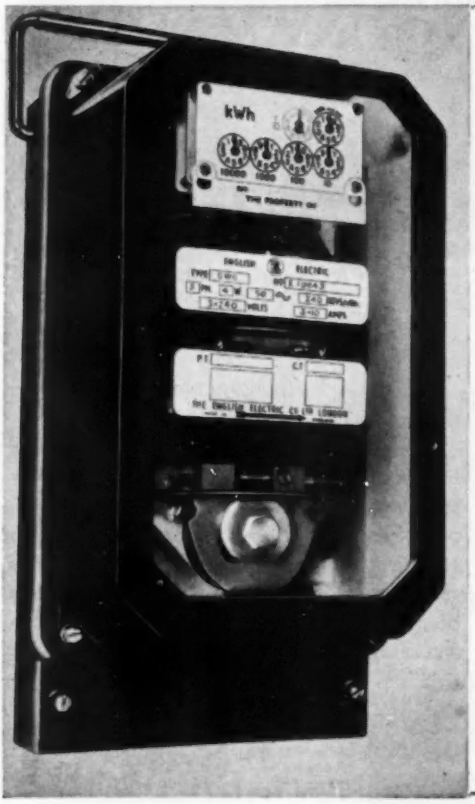


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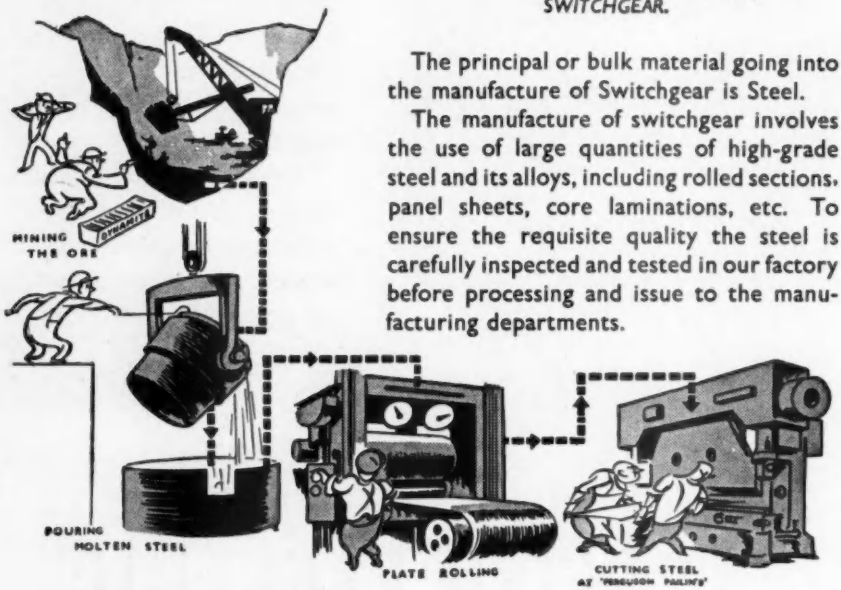


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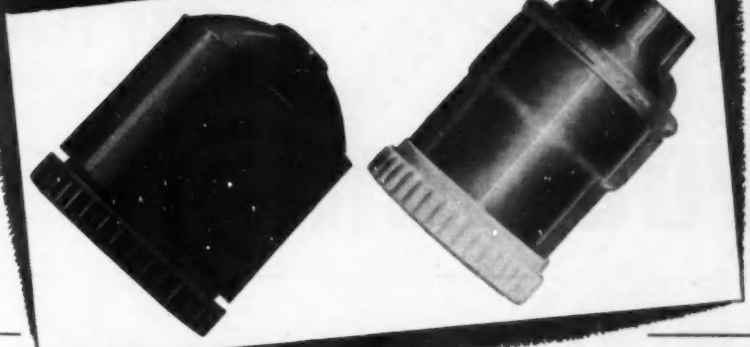

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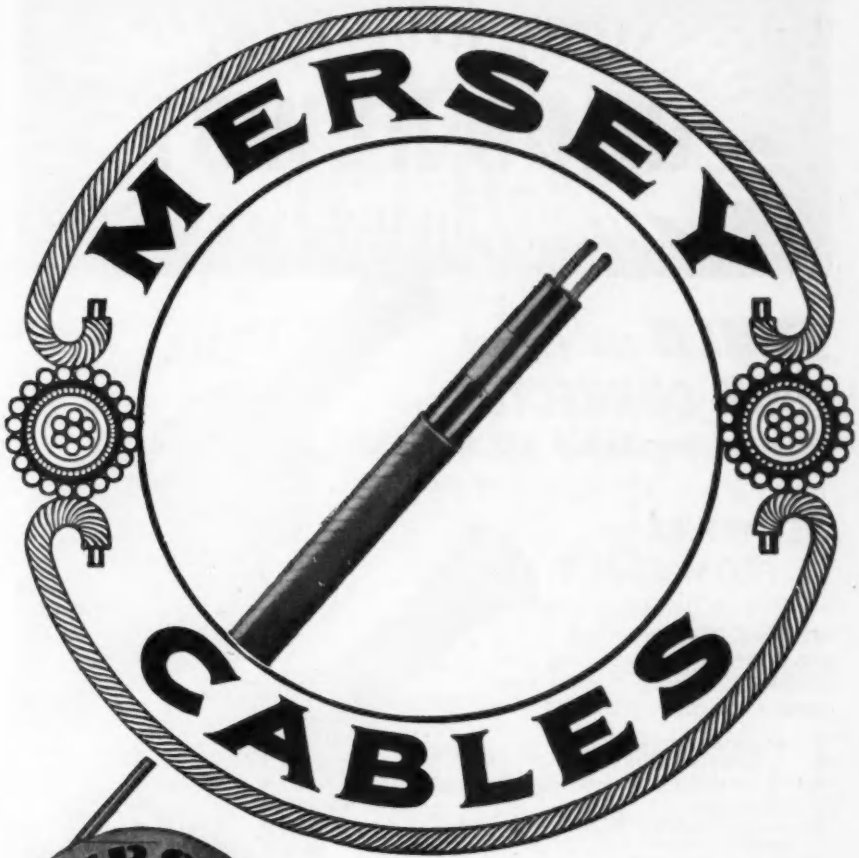

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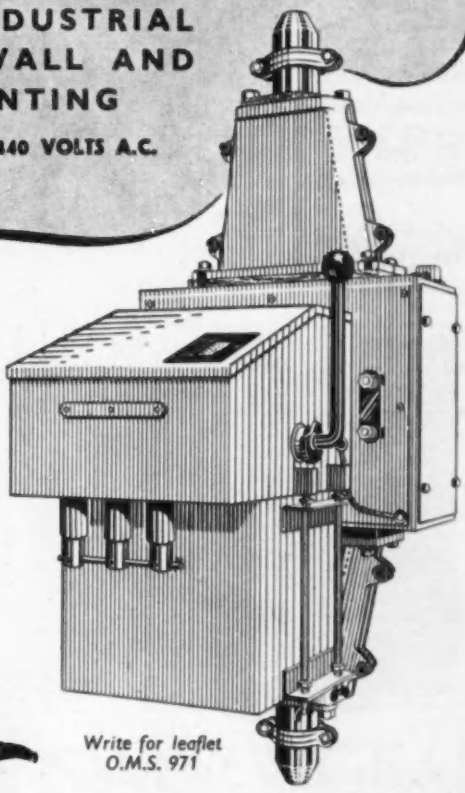

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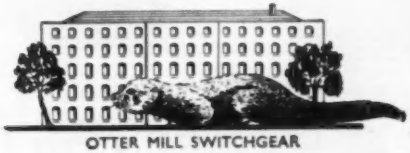

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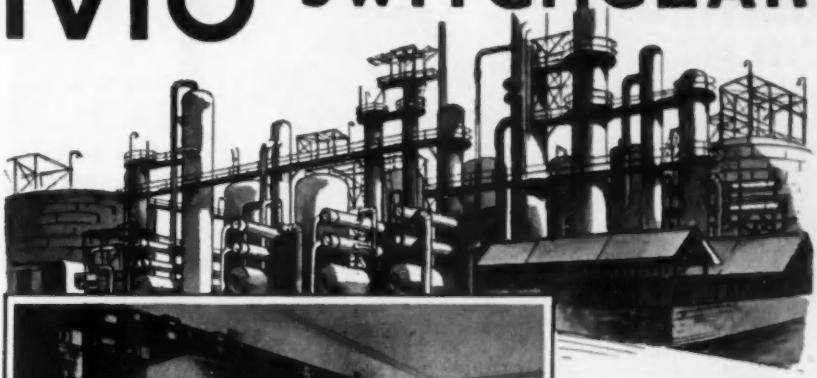

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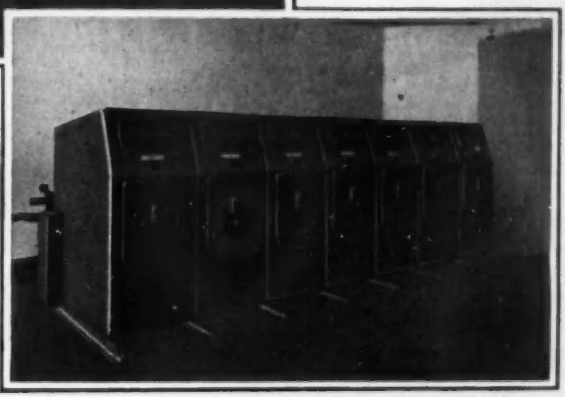

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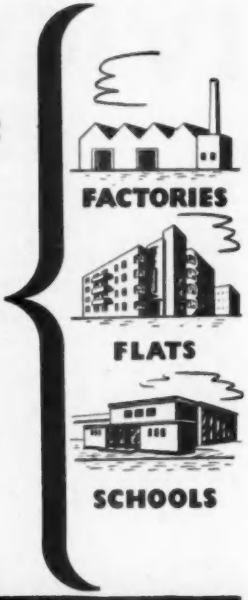


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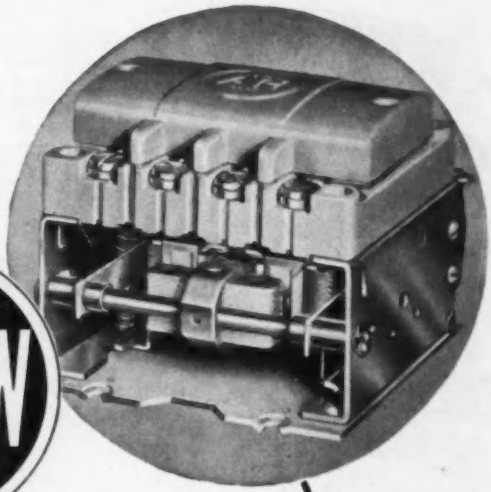

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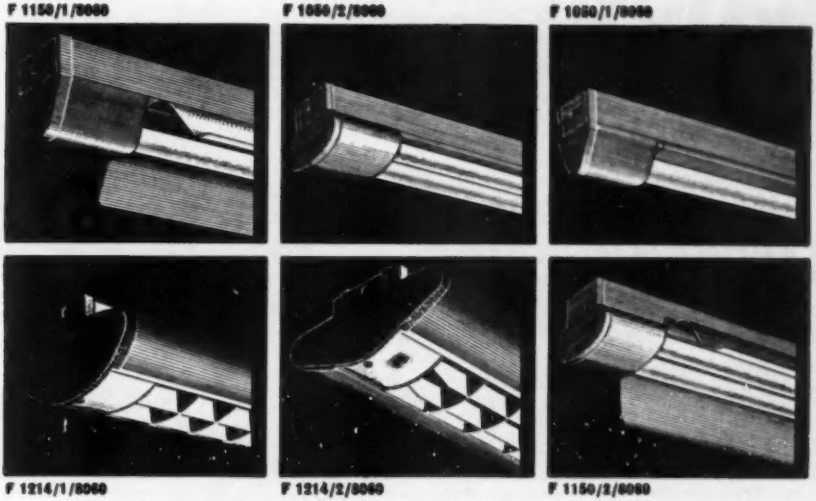


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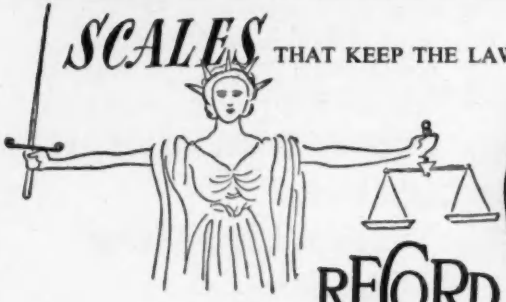

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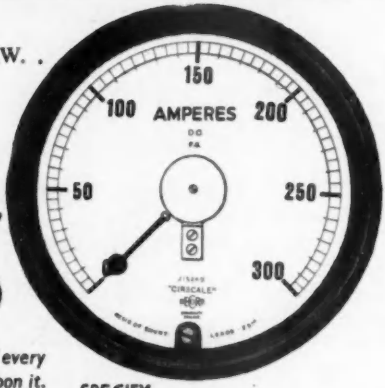


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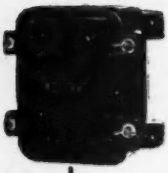

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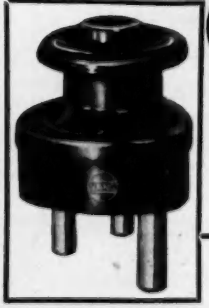

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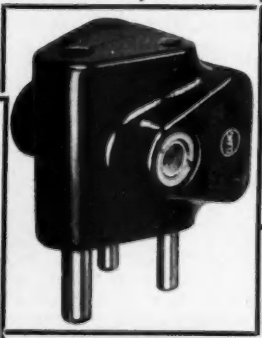

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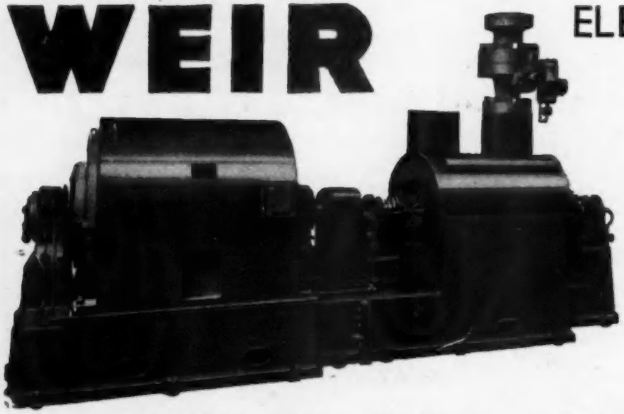

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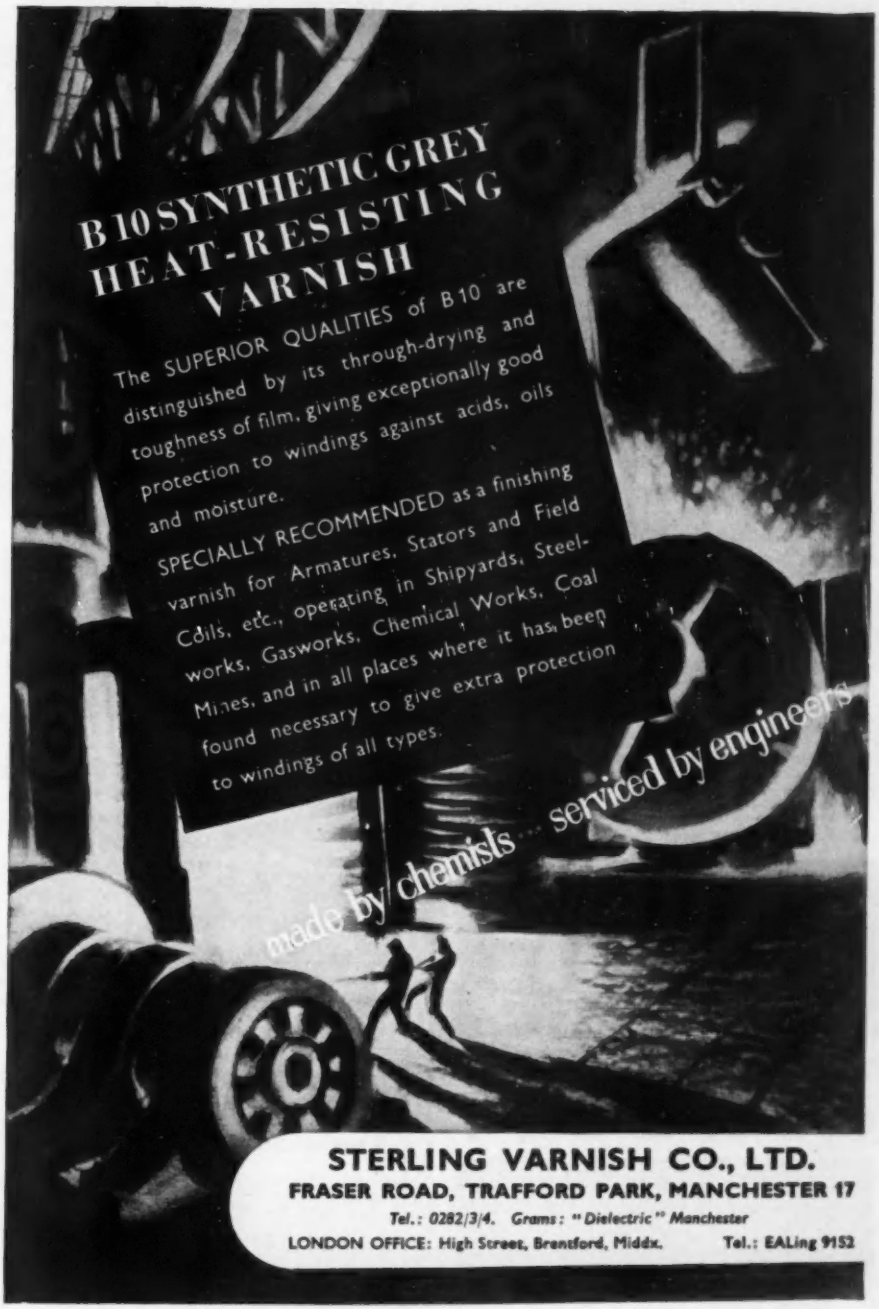
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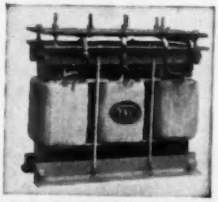

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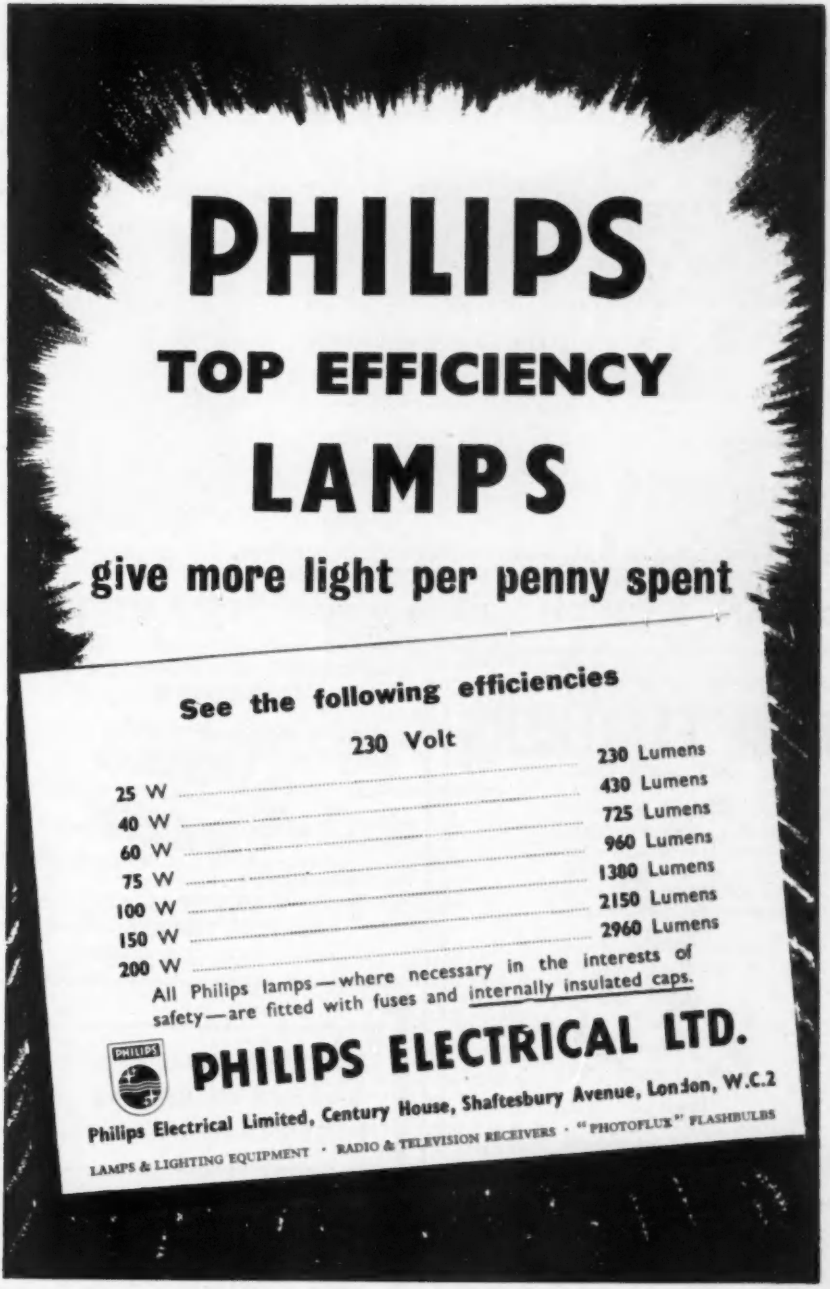
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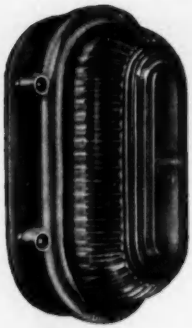

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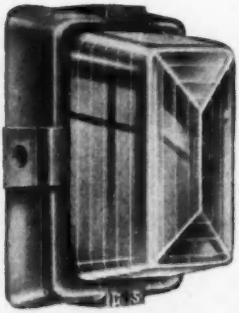
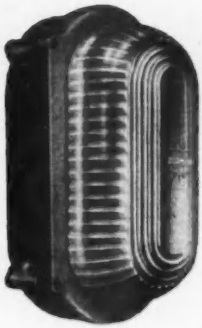


DIOLUME



DIOPAL

ORDSAL

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**DORMAN & SMITH (LIGHTING DIVISION) MANCHESTER 5**

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## POWER, POWER FACTOR & REACTIVE kVA

*can now be determined by means of—*

*The Universal AvoMeter*

## POWER FACTOR & WATTAGE UNIT

***This new, simple to use Unit can replace Dynamometer Wattmeters and Power Factor Meters in those instances where :—***

1. **Checks have to be made on single, two or three phase, balanced or unbalanced loads.**
2. **The purchase of costly test gear cannot be justified.**
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5. **Very low readings are required, which cannot be obtained upon a conventional Wattmeter.**

***This one Accessory, used in connection with its AvoMeter, will cover an enormous range of wattage readings hitherto necessitating the use of several expensive instruments.***

Power Factor readings from unity to zero, and Wattage readings from below 1 Watt to any upper limit (provided that suitable current transformers are available) can be taken upon single, two or three phase, balanced or unbalanced A.C. circuits from 100-450 volts, provided that the normal sinusoidal waveform is present.
The unit will determine the reactive kVA required to produce any degree of power factor improvement from 0·3 on inductive loads.

The Unit will only operate with a Model '7' or a Model '40' AvoMeter fitted with sockets marked "P.F." For some time past, instruments leaving the factory have been fitted with these sockets, but earlier models not so fitted can be modified by us for £3:5:0, plus the cost of any repairs, should they be necessary.

The Unit, which is the same size as the AvoMeter, weighs 3¼ lbs.

UNIT COMPLETE
**£10**
An AvoMeter Leather Case to contain the Unit can be supplied at £3:0:0

*When ordering, please state whether the Unit is required for use with a Model '7' or a Model '40' AvoMeter.*

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We are confident that in the cooker market there is no better value for money than the B.N.E. Model C.49.

It is of the popular flush-to-floor design and has a tasteful two-tone ivory vitreous enamel finish admirably suited for modern kitchen schemes. The thermostatically controlled oven, fitted with a counter-balanced drop-down door, is one of the largest marketed, and the hob is the unique B.N.E. design which permits conversion from two-plate to three-plate should the need for increased capacity arise. A capacious hot-cupboard is provided and a large storage drawer in the base is optional.

The C.49, moreover, can be highly commended for its outstanding efficiency in operation and for the many features it possesses which simplify cleaning and maintenance. Its extremely robust construction from the best materials obtainable is also worthy of note, a fact which ensures many years of reliable, trouble-free cooking.

The B.N.E. C.49 conforms with B.S.1195, E.D.A. interchangeability specifications, and British Standard Code of Practice, No. 36431.

**BRITISH NATIONAL ELECTRICS LTD**

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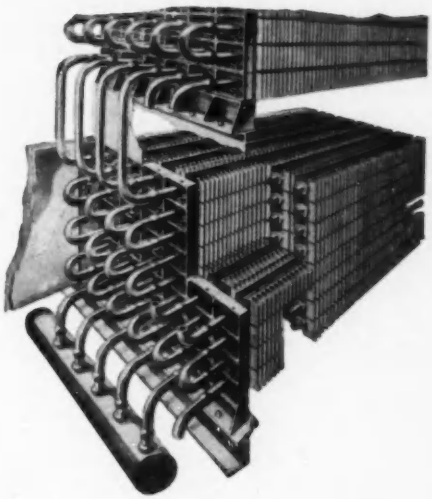
Printed in England for the Proprietors, THE ELECTRICAL TIMES, LTD., by SUN PRINTERS, LTD., London and Watford, Herts, and published at Sardinia House, Sardinia Street, London W.C.2. March 19, 1953

*For waste heat recovery at highest pressures*

# SENIOR *welded* ECONOMISER



The illustration shows the construction of the tube elements in the Senior Welded Economiser, as used in modern Generating Stations. Maximum heat transfer is effected by H-gilled sleeves which are shrunk on cold-drawn steel tubes, all tube joints being welded. The construction is suitable for all operating pressures.

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## SINGLE, DOUBLE & TRIPLE EFFECT

WITH VAPOUR RECOMPRESSION FOR HIGHEST EFFICIENCY.

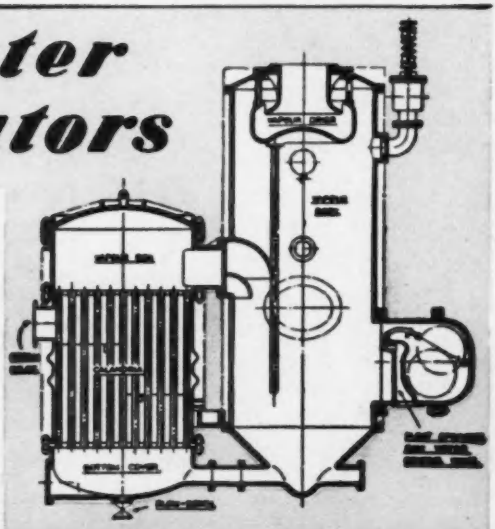
**Low Vapour Velocity—** High Condensate Purity

**Ample Surface—** Infrequent Cleaning

**Straight Tubes—** Easy Access

The drawing shows the sectional arrangement of a single effect Evaporator.

H104A



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